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Haute école de gestion
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The financial and economic impact of the U.S. Government shutdown of October 2013 on trade and the role of information in commodities trading

Bachelor Project submitted for the obtention of the Bachelor of Science HES in Business Administration with a major in International Management

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Declaration

This Bachelor Project is submitted as part of the final examination requirements of the Geneva School of Business Administration, for obtaining the Bachelor of Science HES-SO in Business Administration, with major in International Management.

The student accepts the terms of the confidentiality agreement if one has been signed. The use of any conclusions or recommendations made in the Bachelor Project, with no prejudice to their value, engages neither the responsibility of the author, nor the adviser to the Bachelor Project, nor the jury members nor the HEG.

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Geneva, May 29th 2015

Aurélie MESSERLI

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Executive Summary

The role of information on the markets is crucial as its purpose is to make the trade more efficient and transparent. The data are released by different sources and each market participant has to be able to sort them out and chose the ones that are more relevant for their activities. For most of the professionals, the data coming from the U.S. Government are the original and most reliable source of information.

The U.S. federal shutdown of October 2013 created some fear and uncertainty in the United States but also worldwide. There was no information on the length and on the potential consequences that the closing would have on the economy. The market participants in commodities trading have been impacted by this event, as the national entities delivering data reports to the markets were closed for a period of two weeks. As a result, some categories of players active on the commodities markets were basically 'flying blind' as they did not have access to the necessary information that they usually base their trading decisions on. This report contemplates the potential impact that the closing had on the trade of crude oil and corn in October 2013. The main objective is to determine whether the markets are too dependent on the release of information coming from the Government and what this may imply in terms of risks.

The analysis of the West Texas Intermediate and Brent crude oil markets established that the shutdown created some volatility on the spot markets; however, not in a significant way. Additionally, according to the findings, the futures markets of WTI have been impacted as there was less volume traded during the month of October 2013. Unfortunately, the prices of October 2013 for the futures contracts of crude oil and corn were not publicly available. As a result, only the volume traded on the futures markets were analysed.

On the other hand, the corn markets did not manifest a strong impact from the U.S. Government shutdown. The spot markets showed some volatility; however, compared to other years it was not of great meaning. Throughout the interviews held for this project, many professionals from the agricultural commodities trading businesses did mention that they noticed a decrease in the global volume of contracts traded during October 2013. Nevertheless, after analysis of the amount of corn futures contracts traded, there was no evidence that there was a decrease in the numbers of commitments at this period. It may have impacted other agricultural goods but the corn markets showed no significant differences.

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Glossary

There may be some terms used in this Bachelor project that may be unfamiliar to the reader. In order to enhance the comprehension, this glossary will explain the terminology and references that need to be further developed.

In this report, an asterisk (*) will follow the words or expressions that are clarified in the glossary when they appear for the first time in the text.

API Gravity: *"An arbitrary scale expressing the gravity or density of liquid petroleum products."* The crudes considered as 'light' generally have an API exceeding 38 degrees. On the other hand, the 'heavy' crudes have an API gravity of 22 degrees or less. Finally, the crudes having an API ranging between 22 and 28 degrees are considered as 'intermediates' (EIA, 2015).

Bushel: A bushel is a unit of measurement used mainly in the United States in order to assess the weight of certain commodities. In the majority of the rest of the world, the unit used in place of the bushel is the metric ton. A bushel of corn represents 39.96 metric tons (Knowles, 2014).

Cost-of-carry: For physical commodities the cost-of-carry represents the costs of storage space, insurance, and finance related to the fact of holding a physical good (CME, 2015b).

Free on Board (FOB): FOB is part of a set of international trade terms called 'Incoterms' that determines the obligations and responsibilities of the buyers and sellers in each transaction. Under FOB, the risk passes to the buyer once the goods are delivered on board of the vessel by the seller (Clarke Global Logistics, 2015).

Future contracts: *"A legally binding agreement to buy or sell a commodity or financial instrument at a later date pursuant to the Rules of the Exchange"* (CME, 2015b).

Hedger: Individuals or firms that use the futures markets in order to protect their positions and to offset the price risk occurring when they intend to sell or buy a commodity (CME, 2015b).

Long position: *"A market position in which the trader has bought a futures contract or options on futures contract that does not offset a previously established short position"* (CME, 2015b).

Open interest: *"The total number of futures contracts long or short in a delivery month or market that has been entered into and not yet offset or fulfilled by delivery."* This term is used as a synonym for 'Open Commitments'. Each transaction has a buyer and a seller; however, for the calculation of the open interests, only one side of the contract is counted (CME, 2015b).

Option contract: *"A contract that gives the bearer the right, but not the obligation, to be long or short a futures contract at a specified price within a specified time period."* (CME, 2015b).

Shale revolution: The gas of 'shale' is a natural gas that is captured into shale rock formations below the surface. The newly advanced technics in hydraulic fracturing or "fracking" - which consist in injecting fluids into the rock formations to help the gas to flow out and extract it - has boomed the production of shale gas in the United States. As a result, the U.S. gas prices have reached a ten-year-low in April 2012. The prices of gas are much lower in North America than in Asia or Europe (Financial Times, 2015).

Short: *"An open futures or options position where you have been a net seller"* (CME, 2015b).

Speculators: A person who bears the market risk in an effort to benefit from buying and selling options or/and futures contracts by trying to predict correctly the future prices movements (CME, 2015b).

Swap (OTC): ***"****A custom-tailored, individually negotiated transaction designed to manage financial risk, usually over a period of one to twelve years."* The swaps transactions can be negotiated between two counterparties or through a third party such as a bank. The writer of the swap can either assume the risk himself or control his market exposure on an exchange. In a classic commodity or price swap, the parties exchange payments based on the changes in the price of a commodity or a market index while fixing the final price for the physical good. The agreement permits to each party to control the exposure to commodity prices or index values. The settlements are mainly made in cash (CME, 2015b).

Technical analysis: An approach designed to forecast the prices of the commodities by examining the previous patterns of prices, rates of change and differences in the volume of trading and open interest without taking into accounts the underlying fundamental factors of the markets (CME, 2015b).

UNCTAD: The UNCTAD stands for the United Nations Conference on Trade and Development and counts with 194 members States. It is part of the United Nations and is responsible for dealing with international trade. The goal of the UNCTAD is to make the promotion of macroeconomic policies designed to end the global economic inequalities as well as generate sustainable development centered on people. Additionally, the UNCTAD helps the developing countries and countries with economies in transition to develop the capacities that they need to be equitably integrated in the global economy (UNCTAD, 2015).

1. Introduction

The definition of commodities trading is the following:

> "*Our business is moving physical molecules from point A to point B and managing the credit, market and operational risk associated with that. When there's more volatility . . . people will pay us more to do that*"
> (Alireza, CEO of Noble Group, 2014)

The businesses that are engaged in commodities trading will identify the most valuable transformations and undertake all the physical and operational activities needed to carry them out (Pirrong, 2014).

The core activities of a commodity trading firm are to buy, sell and transform the physical goods by identifying potential sellers and buyers and enter into transactions with them. The businesses can be experts in either a specific good or in a sector trade. However, in order to establish their trading strategy, all the companies active in that field of activity have to specialize in:

1. The analysis of data and information on the buyers and sellers, the supply and demand and the price structure for particular commodities markets;
2. The physical traders have to use those data in order to optimize the transformation of the goods (Pirrong, 2014).

The exchange of raw material between the different areas and regions of the world is essential today as it permits to bring resources where they are needed and expected. In order to trade in an efficient manner, it is crucial for the market players to have access to reports and data on storage, production and prices on the commodities. The different data will come from different sources such as the Governments, private reporting agencies or from reliable financial press (Interview with Mercuria[1], 2015).

"Knowledge is power. This is probably more true of the commodities trade than of any other field - with the exception of the military" (Ammann, 2010: 70). There are many different players active on the markets of commodities ranging from the producers to the traders and the customers. All of them are taking different risks and have a different exposure on the markets and, therefore, need specific data. Besides, each market has its own particularities and is influenced by different factors.

[1] See Appendix 4 - Interview with Mr. Benoît Lioud, employee at Mercuria Energy Trading, Geneva, 7th of May 2015.

1.1 Issue definition

The event of the U.S. federal shutdown that occurred in October 2013 disrupted the publication of important reports that the participants in commodities markets use to base their trading decisions on. According to the U.S. Government only the 'non-essential' parts of the administration were closed; however, the markets have been deprived of crucial public information on goods. The Financial Times stated that: *"The situation underscores the commodity trade's reliance on the U.S. Government for supply, demand and other fundamental data"* (Konczal, 2013).

Not all the markets participants have been impacted in the same way. For example, the large commodities trading companies have a research and development department where research analysts are dedicated at finding information on the markets with tools developed internally and consequently saw the Government shutdown as a competitive advantage. On the other hand, smaller trading companies are reliant on the reports that are released by the federal administration (Interview with Bunge[2], 2015).

According to the interviews made with professional trading companies, the commodities spot markets have seen more volatility during the closing due to the uncertainty of the situation. On the other hand, the future markets* have been impacted as there was less volume traded (Interview with Bunge, 2015).

This report will focus on both the trade of corn and crude oil and will analyze the spot prices and the volume of futures contracts traded in order to determine whether those two commodities were impacted by the shutdown and if so, at which level and degree.

1.2 Research question and hypothesis

The research question of this report is the following: **"Traders have taken the availability of the U.S. Government information for granted – is this a new risk and what might it mean?"** There are distinct categories of traders on the markets and each of them has a specific role. The characteristic of each group will be explained in details in the chapter two of this report. For the purpose of this work, I will focus on the physical traders and their relation towards market information.

[2] See Appendix 3 - Interview with Mr. Philippe Aellig, Associate Director for the European Research and Mr. Paul Moreau, employee at Bunge, Geneva, 30th April 2015.

The aim of this research is to determine whether the physical traders are too dependent on the information released by the U.S. Government. The two main hypotheses that will be tested are the following:

Hypothesis 0: The physical traders have taken the U.S. Government information availability for granted and that represent a great risk as they are dependent on the release of the reports. As a result, an event such as the shutdown may disrupt greatly the markets and the price dynamics.

Hypothesis 1: The physical traders do not have any dependency on the U.S. Government information and have other ways to determine the data that are being published by the federal authorities. The publications still have a great importance; however, it is the responsibilities of the physical traders to not rely on a single source of data and arrange for various channels of information.

1.3 Scope of the work

The main objectives of my research are to understand how the markets can have access to information and what happens when the link to the data is interrupted or uncertain, as it was the case during the U.S. Government shutdown of October 2013.

In order to answer the research question, this report will focus on the impact that the closing had on energy and agricultural markets. Besides the direct effect on goods, the report will also describe the importance and the role of information in the domain of commodities trading.

The main goals are to determine:

1) If the U.S. Government shutdown of October 2013 affected the commodities prices;

2) If the shutdown had an impact on the volume of contracts traded in October 2013;

3) Who are the players of the markets that are the most affected or at risk?

1.4 Content of the research

As the occurrence of the shutdown is recent, the academic documentation is somewhat limited on the topic. On the other hand, the matter of the role of information in

commodities trading is a subject of great interest for the academics and practitioners as they are very concerned with the issues of price transparency, as well as, the supply and demand information. As a result, this project is based on articles published from specialized institutions, reports from entities working in commodities trading, publications from the White House, analysis and reports on spot and futures markets and interviews with professionals working for trading companies or organizations active in commodities trading.

The interviews were held with physical commodities traders working for large trading companies in Geneva. Four of them are working in the field of agricultural commodities and one of them is working for an oil trading company. Moreover, one interview was held with an economist working for the United Nations Conference on Trade and Development. The conversations were held in person or over the phone, depending on the availability of the interlocutors. The talks took place between mid-April 2015 and mid-May 2015 and lasted in average 30 minutes.

In order to analyze the markets, the data on spot prices of WTI and Brent were taken from the Energy Information Administration. The spot prices of corn come from Indexmundi; and finally, the amount of futures contracts of WTI and corn traded during the period of the shutdown were taken from the report *'Commitments of Traders'* published by the Commodity Futures Trading Commission (CFTC).

The spot prices will be analyzed and compared to the last five years in order to determine whether the U.S. federal shutdown had a great impact on the trade of crude oil and corn. Moreover, the analysis will help determine if there was any sign of important volatility during this period of uncertainty.

The futures markets will be analyzed through the number of futures contracts traded in October 2013 compared to the previous seven years and the following year. The investigation will help us discover if the closing of the Government did impact the volume of contracts traded on the futures exchanges. Moreover, we will see what were the expectations of the different players based on their behaviors on the markets. This report also wanted to analyze the prices of the futures markets of October 2013 and deduce if there was more or less volatility; however, the futures prices for both markets were not publicly available.

1.5 Organization of the thesis

The second part of this project will explain the role of information in the commodities trading world and will detail the different types of markets participants and their role on the markets. Moreover, the report will give more information on the crude oil and corn markets and will specify the different sources of information available for those commodities.

The third chapter of this paper will describe what lead to the U.S. Government shutdown of October 2013 and will define what were the impacts on the U.S. economy as well as on the trade of goods around the world.

Finally, the fourth section will describe into more details the consequences of the shutdown on the trade of crude oil and corn. In order to have a clear picture of the potential consequences, an analysis of the spot and futures markets for those two commodities will be made and compared with the period of the shutdown of October 2013.

1.6 Literature review

In order to establish this report, I did some research and read some literature on the topic of the role of information in commodities trading. The book "*The King of Oil: The Secret Lives of Marc Rich*" (Amman, 2010) gives an insight on the world of oil trading and its possibilities. The publication explains the birth of the spot market for crude oil that was invented by Marc Rich and his associates. The book, through Marc Rich, explains the importance to have information and data on the markets as well as the power of knowledge and networks. According to Rich, *"The key to success - and to real wealth - is long-term thinking"* (Amman, 2010: 176).

The report on "*Price formation in financialized commodity markets - The role of information*" gives us an insight in the world of commodity trading and how the prices are formed. According to the publication, the prices and the volatility of the commodities have started to increase greatly during the year 2005. One of the reasons is the major changes in the fundamentals of commodity trading, especially the growth of emerging economies that changed the consumption habits and needs. Nonetheless, another reason for the commodity price development is the increasing volume of

financial investments that are made on the commodity derivatives markets. According to the report, this is an issue as it increases the prices of the commodities away from reality, which affect negatively the producers and the consumers (UNCTAD, 2011).

The publication also deals with the role of information on the commodity derivatives markets and develops especially the concept of the efficient market hypothesis (EMH). This model implies that all the information and data that are publicly available have a direct impact on the prices of the commodities in the markets. However, the report of the UNCTAD demonstrates that EMH does not apply for the futures markets of commodities. Based on their conclusion, the organization states that the market players base their decision on reports but also on aspects that are not directly related to the commodities. This business is also really uncertain and unstable, which results in the participants being tempted to follow the decisions of their competitors and the trends of the markets. This behavior is called "intentional herding" and consists in imitating the moves of the other commodities traders in order to discover market information. This behavior results in trading decisions based only on following price series, which may lead to a 'commodity price bubble' (UNCTAD, 2011).

According to the research, there is a clear evidence of the impact of index investors on the price developments of crude oil and maize. Moreover, with the increasing importance of the money managers on the markets since 2009, a high correlation has appeared between their position and the changes in prices. Furthermore, the report states that the flows of information coming from other financial markets are increasingly impacting the dynamics of commodity futures. The announcement of economic news that are not related to the commodity in question, may also impact the markets (UNCTAD, 2011).

In order to establish its publication, the UNCTAD interviewed several market players that all agreed in the fact that market transparency on the futures markets had to be increased. The United States has put into place the Commodity Futures Trading Commission (CFTC) that works on the regulation of the commodity futures trading in the USA. Europe did not have a reporting system similar to this institution at the time of the report (UNCTAD, 2011).

The publication *"Commodities: Commodities Investing Guide to Wealth Building Through Investing in Commodities And Commodity Trading For Commodities Investing and Commodities Trading Success"* (Mc Quilkin, 2014) gives us an insight in the world

of commodities trading and its specificities. It basically explains how commodities trading works and how physical traders can make profit from this field. The book emphasizes the fact that it is also good to invest in commodities rather than trading them. The publication gives an overview of the different possible manners to invest in commodities (Mc Quilkin, 2014).

The book "*The Glossary of International grain trading*" (Knowles, 2014) gives an overview of the main terms in the agricultural commodities trading world and principal concepts as well as terminology. It also details more about the main companies trading agricultural commodities: *"ABCDs the massive multinational grain conglomerates that dominate the grain trade. ADM, Bunge, Cargill, Dreyfus"* (Knowles, 2014: 392). According to the document, the grain industry will grow in importance over the next years because food security is becoming an increasing issue in some parts of the world. The book clarifies the terminology used when entering into contracts on the grain industry as well as the vocabulary used in the shipping industry. This relates mainly to incoterms and freight theory (Knowles, 2014).

The report "*The Economics of Commodity Trading Firms*" (Pirrong, 2014) gives us an overview of the basics of commodity trading and explains the different risks that a commodity trading firm is taking throughout the course of its operations. Besides, the publication gives an overview of the financing of the companies and their asset structure. The introduction of the paper gives the main definitions needed to understand the industry of commodities such as:

> *"Commodity trading firms are all essentially in the business of transforming commodities in space (logistics), in time (storage), and in form (processing). Their basic function is to perform physical 'arbitrages', which enhance value through these various transformations."* (Pirrong, 2014: 3)

The publication is a rich explanation of what are commodities trading firms and which risks they are facing. The first part is explaining how the commodities are processed and transformed into finished goods. According to Pirrong, the trading firms are creating value by optimizing the transformations and, as a result, adjusting the mismatches that occur between the demand and the supply. Part II of the publication explains the various risks that the firms face on the markets and part III explains how the commodity trading companies manage those risks. Part IV deals with the financing

of the businesses active in the field of commodities and, finally, part V tells us more about the asset ownership and the vertical integration of those firms (Pirrong, 2014).

The report *"An Overview of Major Sources of Data and Analyses Relating to Physical Fundamentals in International Commodity Markets"* (Fajarnes, 2011) enters into the debate intending to determine if the price changes in the markets of commodities are due to the movements in the physical supply and demand essentials or, on the contrary, to the speculation of the financial investors. The publication points out that there is a need for more transparency and better information on the futures and physical commodity markets (Fajarnes, 2011).

The markets of commodities have seen increasing volatility over the last years, which started a debate on the causes of those intense changes. According to the study, the main factor that will have a consequence on the medium and long-term trends in the prices is linked to the factor fundamentals. However, in the short-term, the financial investors may have a potential impact on the movements of prices. One fact that is widely accepted is that there is a great need for better transparency and information on the markets. This would be beneficial, as it would decrease the uncertainty and help their functioning (Fajarnes, 2011).

The paper discusses the various sources of information for three groups of commodities: the food and agricultural industries, the energy commodities and the minerals and metals. It details the main sources of information for those markets and also mentions that, due to the increasing investment of banks and financial institutions in the trade of commodities, there are new sources of information coming from those entities. Today, the evolution forecasts made by the financial institutions have influence on the markets. Many institutions release reports on commodities such as BNP Paribas, Goldman Sachs, JP Morgan, etc. (Fajarnes, 2011).

There are several ways to find information; however, some gaps still exist. To mention only a few, one of the main issues is that a great proportion of stocks of commodities belong to private entities, which do not necessarily report data on inventories. Finally, the report asks for a better timeliness and an increase frequency in the releases. Finally, the sources of information shall be homogenized and better coordinated as to facilitate its accessibility (Fajarnes, 2011).

2. The role of information in the trading world

2.1 History / Background

In the past years, markets have become increasingly dependent on the access to data. Trading commodities require information that only the main actors of the markets can provide. This relates mainly to the prices, stocks, exports, imports and availability of the raw materials. In order to provide information, specific data reports are published daily or weekly by private or public entities. The frequency will depend on the commodity and in which country it is produced. In this report, I will focus on the information needed on the crude oil markets as well as the data needed to trade corn.

An effective market information plan can help greatly the different actors of the physical markets such as the producers, traders, speculators or policymakers. The role of information is also to allow a better and coordinate distribution of the products between different areas by giving data on prices, quantities and on the quality of the commodities (Mc Quilkin, 2014).

The data come from different sources: Governments, specialized press and reporting agencies. For example, the United States Department of Agriculture releases various publications and reports on the state of agricultural commodities. Some of the sources are made available for free and some others require a payment, for example, the Financial Times or the Platts assessment (Mc Quilkin, 2014).

Every trading companies uses the information released by the Government in different ways. During this period of shutdown, the companies had to look for other ways to find an estimation of the quantity of commodities and their prices, which was easier for larger entities than for the smaller ones. The largest companies on the market, such as Bunge for example, have internal tools at their disposal that will allow them to make an estimation of the different figures published weekly or monthly. For the smaller sized companies, it is much harder to find the data as they do not necessarily have a presence in the country of production and cannot afford to pay to receive information (Interviews with Bunge and Cargill[3], 2015).

There is a lot of uncertainty regarding the quality of the information, especially concerning the state of inventories and the timeliness. As a result, the market

[3] See Appendix 2 - Interview with Cargill, Geneva, April 15th 2015.

participants have to be able to make a selection and choose only the most reliable sources of data (UNCTAD, 2011).

According to the efficient market hypothesis (EMH), the role of information that flows into the markets is determinant for the development of prices in commodity derivatives markets, especially for the futures markets. This model supposes that all the data that are available to the public have an instant impact on the prices. As per the EMH, even the personal information that are in the possession of individual market participants have a consequence on the markets as those will be reflected in the positions made by the people owning the information (UNCTAD, 2011).

On the contrary, the United Nations Conference on Trade and Development has made a study that demonstrated that the efficient market hypothesis does not apply to the current commodity futures markets as the markets participants base their trading decisions on additional factors that are not only related to the commodity (UNCTAD, 2011).

The access to updated and reliable data is important in order to have accurate price expectation and an efficient functioning of the markets. According to the UNCTAD, a gap in the availability of accurate information would force the participants on the markets to trade without precise data therefore leading to more volatility and cause a divergence between the actual and traded prices for some time. In this case, the market participants will engage into herd behaviors, which occur when there is a situation of uncertainty (UNCTAD, 2011).

The herd behaviors may be defined as "*the tendency of individuals to mimic the actions of a larger group, rather than acting independently and on the basis of their own information*" (UNCTAD, 2011: 20). It may be characterized by behaviors such as overreaction or positive feedback strategies (closely related to technical analysis*) (UNCTAD, 2011).

The publication states that a harmonization of the data provision and presentation would permit to facilitate the access to the information. Moreover, as some of the data are held privately, the reports may be incomplete or uncertain due to their lack of access to the private information (UNCTAD, 2011).

2.2 Importance and role of information for the markets

There are various types of participants active on the commodity markets. In the reports that are released, the diverse categories are usually differentiated based on their market moves and positions. This is the case, for example, in the report *"Commitment of Traders"* published weekly by the Commodity Futures Trading Commission (CFTC) and that gives precise information on the positions of each categories of market players. The separation of the categories allows for a better transparency about the movements of the players on the futures markets.

Until 2009, the CFTC used to separate the players in only two categories: the 'commercial' and the 'non-commercial'. The commercial were a synonym for the group of hedgers*, while the non-commercial represented the speculators* (UNCTAD, 2011).

Since 2009, the CFTC started to publish the *"Disaggregated Commitments of Traders"* that separates the traders into four categories:

1. The producers, merchants, processors and users: this category represents the people or firms engaging in the production, processing or packing of physical goods and that uses the futures markets in order to control their risks by hedging.

2. The swap* dealers: this class of participants deals mainly with swaps and also uses the futures markets to manage or hedge the risks that they take with their swaps transactions. The counterparties may be either speculative traders (i.e. hedge funds) or commercial clients that control their risks.

3. The money managers: under the CFTC, the money managers represent the traders that are committed to manage and conduct organized futures trade for their clients.

4. The other reportables: every other trader that is not into one of the three categories mentioned above.

The report is published every Tuesday and is available in a short and long format (CME, 2015a).

Having information available and being able to process them is key to the market participants as the data are the basis to determine the prices of the commodities. Moreover, the constant changes and new flow of information force the market players to constantly update their expectations when the data became available (UNCTAD, 2011).

2.2.1 The market players

The value chain of commodities includes a very large number of players such as the extracting companies, the Governments, the producers and farmers, the shipping and transport companies, the different categories of traders, the investment banks, the funds, the investors and the insurers (Graber, 2014). In this section, the principal market participants for the crude oil and corn markets will be presented.

The commodities trading firms are evolving in a very competitive environment and the business is changing constantly, as there are very often new regulations and trade flows. The new trends on the markets are bringing new players as stated by KPMG:

> *"As opportunities appear on the market, new players such as private equity funds, sovereign wealth funds, and hedge funds are participating in investments, thereby limiting trading house exposure".*
>
> *(KPMG, 2015: 34)*

2.2.1.1 For the oil markets

A. For the oil producers - oil exploration and production

There are two main groups of oil producers that have very different behaviors on the market: the non-OPEC countries and the OPEC countries. The non-OPEC countries are considered as price takers because their production is related positively to the prices and negatively to the costs. On the other hand, the countries that are part of the OPEC form the only allowed cartel worldwide and have operations that are strategically planned. The OPEC produces reports on the trends of the markets of crude oil and analyses the different geopolitical events that may have an impact on the prices and the volumes of crude oil traded (UNCTAD, 2011).

The oil producers have a specific knowledge about the production of oil and refined products. They usually do not base their decisions of investment on a specific or particular report and test their products against a range of prices in order to ensure that their investment will make a minimal return. This category of market players is active in hedging activities as they usually depend on the financing of the banks (Campbell, Orskaug, Williams, 2006). The OPEC countries publish their own report on the trends in the crude oil markets; therefore, the shutdown did certainly not impact them.

B. For the intermediaries

1. Shipping and transport companies

The shipping and logistics companies are taking care of transporting the extracted crude oil into storage or to the refineries and to the final customers. The non-release of the reports from the U.S. Government did certainly not affect this category, as they are not dealing directly with the prices of the commodities.

2. Processors - refineries

The refineries are the businesses that will transform the crude oil into finished products that will then be sold to the end customers. All refineries are optimized differently to operate various type of crude oil. The information released to the markets can give them an overview of the extraction and production volume.

3. The retailers

The retailers are the businesses that will sell the finished products to the end customers. Their final prices will be based on the purchase cost at which they bought the end product; therefore a disruption in the release of the reports that may have lead to volatility may change the price of the final good.

C. For the financial markets

1. Money managers

The money managers are describe as: *"the entities that deal primarily in swaps for a commodity and use the futures markets to manage or hedge the risks associated with those swaps transactions"* (UNCTAD, 2011: 19). They can be financial investors, hedge funds or institutional investors. They are engaged in commodities trading mainly because they want to diversify their portfolio. Moreover, the returns received from the commodities markets are less volatile than the ones coming from equities or bonds on the financial markets. Finally, the investors have the opportunity to hedge their commodity futures contracts against the inflation and the exchange rate (UNCTAD, 2011).

The money managers have a short-term goal and want an active strategy of investment that takes into consideration the short-term supply and demand changes. They base their decision on the fundamentals of macroeconomics, research and

analysis on commodities, algorithm trading and trends (UNCTAD, 2011). As a result, we may assume that the reports released by the U.S. Government are of great importance for them. The hedge funds usually have positions in the most liquid segments of the market so they have the opportunity to close them as quickly as possible. The oil markets have many opportunities for hedge funds (Campbell, Orskaug, Williams, 2006).

2. The swap dealers

This category deals first in swaps for a good and utilizes the futures markets in order to help them control and hedge the risks that they take with the swaps transactions (Campbell, Orskaug, Williams, 2006). They are part of the group of hedgers (UNCTAD, 2011). We may assume that the information released by the Government are important for this category as it will help them to make decision for their deals.

3. The derivative traders

The derivatives traders are the people active in the trade of futures contracts, forwards contracts, swaps and options. The derivatives represent contracts that will help to hedge the risks, however, they can also be used for speculative purposes. The information released by the U.S. Government is of great importance, as they will base their trading decisions on them (UNCTAD, 2011).

4. The financial traders

The financial traders use all kind of instruments to trade on futures exchanges and over-the-counter markets. This category of traders uses mainly official statistics. On the crude oil markets, the most important information comes from the International Energy Agency and the Joint Organizations Data Initiatives (UNCTAD, 2011).

5. The physical commodity traders

The commodity traders are identifying the constraints that make the transformation of the goods limited and try to find alternatives in order to be able to bypass them. They can define their role as "finding and exploiting arbitrages" (Pirrong, 2014). An arbitrage occurs when the worth of transforming a good is higher than the cost to make the transformation. As a result, the commodity traders are more concerned with the difference between prices instead of the absolute price of the commodities. They buy and sell physical commodities (Pirrong, 2014).

The main activity of a commodity trader is to solve logistical problems. The technics and strategies used require a great knowledge between supply chain and finance (Besson, Gogniat).

The physical commodity traders are facing many different risks:

1. The **basis risk** is the difference between the price of a good and its hedging instrument;
2. The **spread risk** occurs when there is a mismatch between a commodity and its hedging tool;
3. The **margin and volume risk** are important; however, the commodities trading companies have restricted price risk. The benefit that they make depends on the volume that they trade. The margin comes from the difference between the purchases and sales prices;
4. The **operational risk** can be related to the IT, health or insurance (Pirrong, 2014).

The list is not exhaustive.

According to the interviews held with professionals from the commodity trading firms, the U.S. Government shutdown of October 2013 may have increase the risk of margin and volume as, according to the professionals, there was less volume traded on the futures markets. The oil traders use different markets depending on the type of crude oil that they are trading. The oil trading companies depend on the pricing reporting agencies for the price discovery mechanism. Moreover, the CFTC data are also a very important source of information (UNCTAD, 2011).

During the shutdown, the main problem for the physical traders of oil was the non-release of the Energy Information Administration that publishes weekly an oil inventory report. The publication contains data on the importation of oil, the stocks, and the consumption of the refineries. Even though some market participants could have access to data during the closing thanks to their contact with third parties, the EIA report still remains the standard on the market. Moreover, it is very expensive for the markets participants to obtain private data as it can cost up to $100'000 per year (Wexler, 2013).

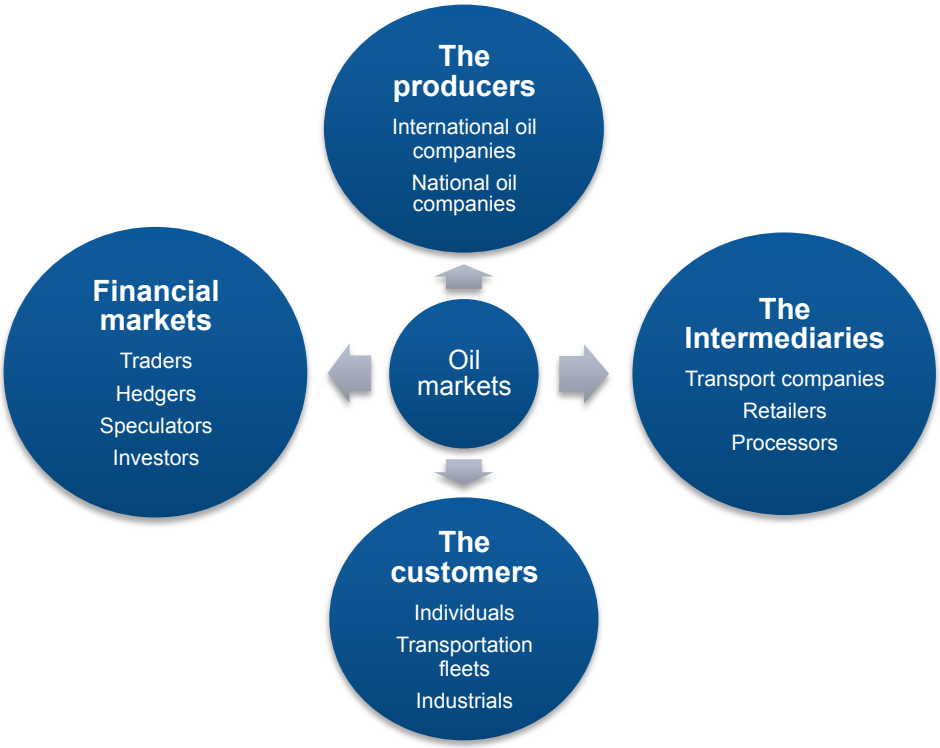
D. For the customers

1. The major global oil consumers

This category includes the industries and companies such as, for example, the airlines businesses. Those can trade oil swaps, futures and options*. However, compared to the oil companies or the investment banks they are relatively small players. We may assume that the non-release of information from the U.S. Government may not have impacted them in a significant way (Campbell, Orskaug, Williams, 2006).

Here is a summary of the value chain regrouping the main actors on the oil markets.

FIGURE 1 - MAIN PARTICIPANTS ON THE OIL MARKETS



Some of the markets participants have been more impacted than others. The categories having the more risks during an event such as the U.S. shutdown are the financial markets and the producers as their goods or financial instrument may loose value due to the lack of information.

2.2.1.2 For the corn markets

Under normal circumstances the United States Department of Agriculture publishes information on the farm productions, the yields of crops, the international trade and the climate forecasts. The reports are released daily, weekly or monthly and form the basis for the prices of agricultural commodities as the data of the USDA are considered as the most trustful source of information. The most important publication is the 'World Agricultural Supply and Demand Estimates' report (WASDE*) that gives important information on the U.S. and worldwide corn markets. On the meantime, the Commodities Futures Trading Commission (CFTC) is ensuring fair practices on the markets (Neumann, 2013).

During the shutdown of October 2013, the USDA and the CFTC stopped their activities but the markets continued to operate. As a result, the market participants were allowed to continue to trade but were basically 'flying blind' concerning the price settlements. The data are constantly evolving and, as a result, the oldest is the information that the traders use to trade the more risks they take. As the CFTC was closed, nobody was able to control the markets and ensure that no manipulation was occurring (Neumann, 2013). As for the crude oil markets, there are various types of players on the corn markets.

A. For the farmers / producers / merchandisers / elevators

This category is engaging in the production, processing and handling of the physical goods. The data on agricultural patterns will allow the farmers and corn producers to take planting decisions based on the demand of the consumers. Moreover, the farmers and livestock producers protect themselves against prices differences and movements by hedging their goods with the help of the futures markets. They need safety against the decreasing prices for corn crops or against increasing prices in the inputs that they bought for example (CME, 2012).

The fact that the United States Department of Agriculture did not release the WASDE report in October 2013 was a great issue for the farmers and producers as they did not know what was happening on the markets (Wexler, 2013).

The producers were still able to enter into futures positions in order to hedge their commodities but the lack of data on the markets made it difficult to offset their positions on time (Otte, 2013).

B. For the intermediaries

1. The shipping and transport companies

The shipping and transport companies dealing with corn are different than the ones dealing with crude oil. The release of the reports may not have impacted them directly as they are probably dealing directly with the producers in order to have information.

2. The processing industries

The main industry that may have been impacted by the non-release of the reports is the ethanol one. The producers of ethanol need the information about the level of stocks and production. As the U.S. Government shutdown occurred during the harvest time of corn, it was a bad timing. The pricing of corn depends also on the usage of corn for biofuel production (CME, 2012).

C. For the financial intermediaries

1. Money managers

In the domain of agricultural trading, the money managers are engaging in the control and the conduct of futures trading on organized exchanges for the account of their clients (UNCTAD, 2011). The reports are important for this category as the money managers base some trading decisions on them; however, they probably have other ways to find information.

2. The swap dealers

We saw in the oil section that the swap dealers are dealing mainly with swaps for a good and they use the futures markets to control and/or hedge the risks linked to the swaps transactions (UNCTAD, 2011). This type of participants probably have different sources of information, however, we may assume that the reports from the U.S. Government are very important for them as it gives precise and valuable information on the markets.

3. The derivative traders

As mentioned in the oil section, the derivatives traders are dealing with all kinds of instruments such as the options, swaps, futures and forwards contracts in order to control or hedge the traded commodities (UNCTAD, 2011).

4. The physical traders

Futures are the most used instrument in grain trade, followed by the options and the swaps. The grain traders don't usually trade on the OTC markets and prefer to trade on the exchanges, as there is more liquidity and more regulation. The physical traders in agriculture focus on the crops analysis and the information on inventories received from statistical offices or special reports (UNCTAD, 2011). For them, the most important impact of the U.S. Government shutdown was the non-release of the WASDE, which is a report published by the United States Department of Agriculture (Interview with Bunge, 2015). The report includes information on weekly crop progress and export sales (Wexler, 2013). The physical traders of grains can have a general idea of the grain sales for the weeks and, as the shutdown occurred during the harvest, they knew that the supplies would increase over the next weeks (Stebbins Reuters, Waters, 2013).

5. For the financial traders

For the financial traders active in the corn markets, it has also been a big problem to trade without the report of the USDA as it was not possible to have information on the state of supply and therefore make reasonable trading decisions.

D. For the customers of corn

1. The livestock feeders

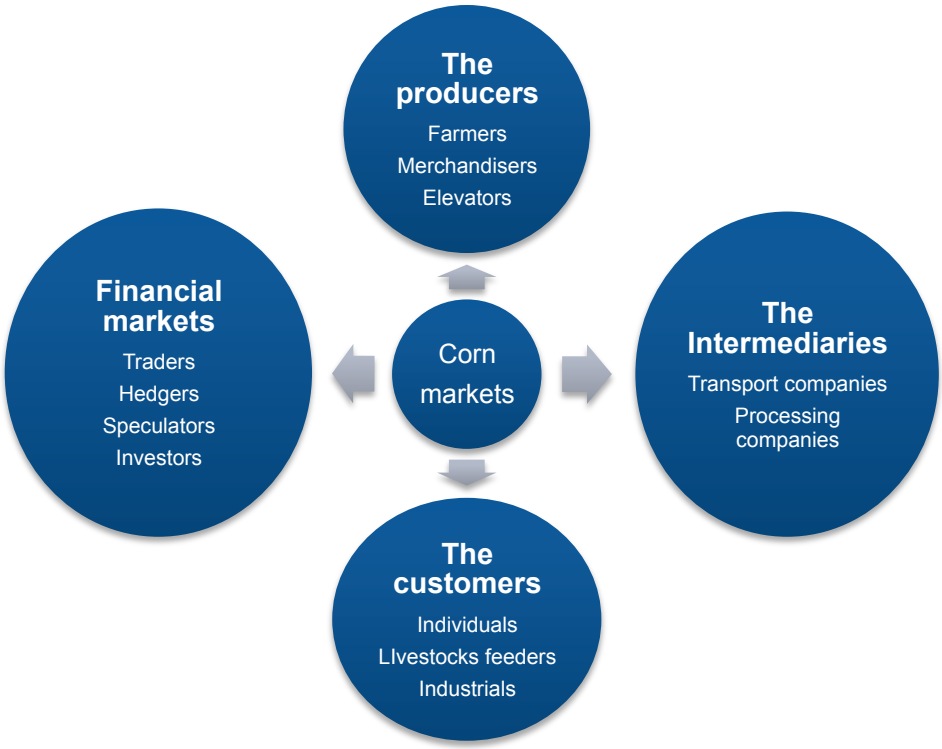
For the consumers of corn that use it as feedstock for example, the information is really important; the shutdown was a big matter for the livestock's traders that rely on everyday prices (Stebbins Reuters, Waters, 2013).

2. The industry of biofuels

We will see later in this report that the industry of biofuel in the USA is closely linked to the production and information coming from the corn markets. A great part of the

production of corn in the USA is used in order to produce ethanol. Therefore, the non-release of information on corn markets directly impacts the industry of biofuels.

FIGURE 2 - MAIN PARTICIPANTS ON THE CORN MARKETS



As for the crude oil markets, we see that the most vulnerable market participants in the corn markets are also the producers and the financial markets. However, we may also notice the importance of the reports for the biofuel industry that rely greatly on the information coming from the corn markets. Every player has been affected in different ways as some are using different sources or even their own econometric models. However, the shutdown probably had more consequences for the smaller players on the markets that did not have the resources to find other information in a timely manner.

2.3 Sources of information for different commodities

The transparency of data about the physical supply and demand fundamentals for the markets of commodities is imperative for the participants, as it will allow them to have precise assumption on the prices and therefore increase the efficiency of the markets (Fajarnes, 2011).

The sources of information are different for each commodity depending on their market; however, there are three general kinds of information that are available:

1. The raw data that comes from databases and that deals with production, consumption, levels of stocks, trade and prices;
2. The data that are processed based on the analysis of the trends in the markets;
3. The forecasts regarding the short-medium and long-term evolution of the fundamentals on the markets.

According to an interview with physical traders hold by the UNCTAD*, the commodity traders use three main categories of sources:

1. The official statistics and publicly available reports;
2. The information that are private and obtained by internal company sources;
3. The data obtained by communicating with other participants.

The information on commodities markets is various and many sources provide the same data under different formats. The markets participants need expertise in order to determine which information is more important and relevant for a specific commodity (UNCTAD, 2011).

The information comes from different sources:

1. The Governments of countries that have expertise in the markets of commodities trading such as the United States or Australia;
2. International organizations such as the United Nations Conference on Trade and Development;
3. Organizations that are specialized in some commodities such as the Organization of Petroleum Exporting Countries;
4. Private sources such as Platts for crude oil.

Most of this information is not made publicly available and require a payment to have access to it.

The large trading companies also obtain information by developing internal tools within the firm. The main objective is to obtain reliable information before the markets (Interview with Bunge, 2015). Furthermore, the physical traders also rely on conversation with other traders to obtain information as it can give them a general idea of the market situation and help them determine whether a commodity is priced at its good value or not (UNCTAD, 2011).

The physical traders also use real-time market information that are provided by Reuters or Bloomberg on the short-term basis. This gives them an idea of the volume traded and the number of open positions (UNCTAD, 2011).

As mentioned earlier, this report will focus on the data required to trade crude oil and corn.

2.3.1 The oil markets

The information regarding the oil markets is coming from specific sources depending on the type of crude oil that is traded. In this project, I will focus on the trade of the West Texas Intermediate crude oil (WTI) and the Brent crude oil from the North Sea. The data reports are crucial and give information on the prices, but also on the storage capacities and stock levels of the commodity. We can notice their importance, as when they are released, there is more volatility on the markets almost instantly and for a period of time more or less long depending on the information received (Interview with Bunge, 2015).

There are more than 300 different types of crude oil that are available and sold around the world. They are classified as 'sour' or 'sweet' and 'light' or 'heavy'. Light and heavy refers to the density of the oil and is measured with the API Gravity*. Sweet and sour refers to the level of sulphur that the crude oil contains. Everyday about 85 million barrels of crude oil are produced worldwide. Afterwards, they are sent to a network of refineries that will take care of processing and transforming the oil into finished products (Platts, 2010).

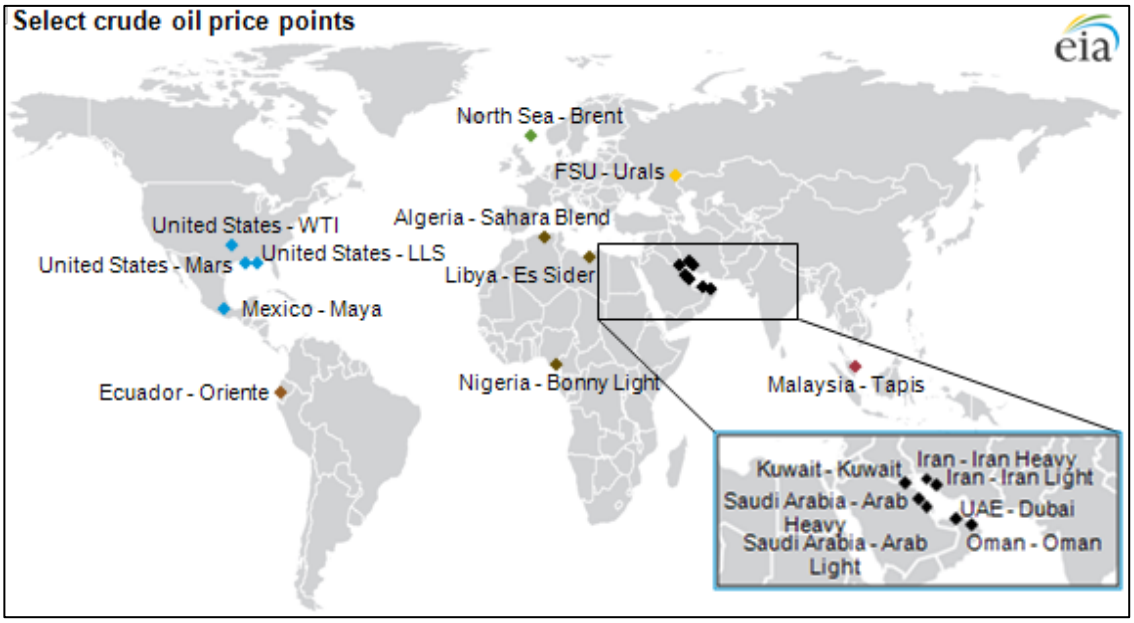
Before getting into details regarding the sources of information for the Brent and WTI crude oil, it is important to explain the differences between those two specific products.

2.3.1.1 West Texas Intermediate crude oil (WTI)

A. Background information on WTI

WTI is the global benchmark for the U.S. crude oil market and the world's most liquid oil benchmark future contract. The key market hub is in Cushing, Oklahoma, which is the delivery point for the New York Mercantile Exchange that deals with crude oil futures. The crude is sweet and light with an API of 38.7 degrees and a sulphur content of 0.45pc (Platts, 2010).

FIGURE 3 - BENCHMARKS OF CRUDE OIL WORLDWIDE



Source: EIA (2012).

On this figure, we can see all the different benchmarks for crude oil around the world. The benchmark for the United States is the West Texas Intermediate. Brent represents the international markets.

The benchmark is composed of different U.S. domestic sweet light crude oils. The futures contracts of the WTI are mainly traded in New York Mercantile Exchange, which is part of the CME group (CME, 2015a). The WTI traded on the NYMEX is the most liquid market of oil worldwide, as there are about 800'000 contracts traded per day (Morsches, 2012). The contracts are mainly physically settled as they are based on pipeline-delivered crude. The supply of U.S. light crude is increasing rapidly due to the shale revolution*. On the other hand, the Brent production is decreasing over the years (CME, 2015a).

The WTI transparency is supported by the U.S. Government, as there are weekly stocks data published on crude oil (Morsches, 2012). The network infrastructure of

pipelines and storage tanks in Cushing Oklahoma make the WTI at Cushing the price maker for the U.S. pipeline crude oil. The data about the storage levels in Cushing are crucial as when full capacity is approaching a small change in stocks may influence greatly the futures prices (Farchy, Meyer, 2010).

The issue of the WTI was that it was disconnected from the markets in general because it had constraints on the logistical side at his pipeline hub in Cushing, Oklahoma (Blas, 2012). However last year there were new and reversed pipelines that were build in order to transport the crude oil from Cushing to the Gulf Coast. This made the benchmark much stronger as it increased the connectivity of the network (Murtaugh, 2014).

2.3.1.2 Brent crude oil

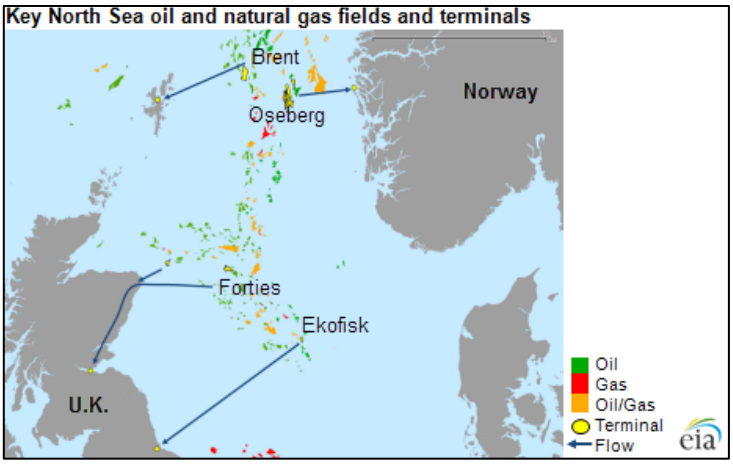
A. Background information on Brent

Brent crude oil is the international benchmark for crude oil and represents more than half of the internationally worldwide crude oil trade supplies. The benchmark is used to establish the value of more than 2/3 of the worldwide crudes. The North Sea Brent Crude is a sweet-light crude with an API of about 38 degrees and sulphur content of 0.45pc (Reuters, 2011).

The benchmark of Brent is composed of a mix of four different "brands" of crude oil that are traded as independent crudes on the physical market: Brent proper, Forties, Oseberg, and Ekofisk, known as BFOE in the market. The cheaper price of those crudes set the benchmark price of Brent. Therefore, an increase of supply or demand in one of those crudes impacts greatly the general price of Brent. The combination of the four blends (BFOE) makes a sweet and low-sulphur crude oil (Reuters, 2011). The Dated BRENT is the international crude benchmark for pricing. The term 'dated Brent' refers to the physical cargoes that are in the North Sea and are assigned to specific delivery (ICE).

Brent crude oil can be easily transported by cargo around the world, which reinforces its relevance towards the global markets and crude oils from other areas of the world such as Nigeria or Colombia that can be priced at a differential with Brent (ICE).

FIGURE 4 - KEY NORTH SEA OIL AND NATURAL GAS FIELDS AND TERMINALS



Source: EIA (2013).
On this map, we can see the four different types of crude oil that form the Brent benchmark.

Today, the production of BFOE is decreasing due to the ageing of the fields that give lesser yields than before and also by the limited pipelines capacities. This may be a problem in the future for the benchmark and actually some big oil trading companies already called for a Brent benchmark reform. The reasons are that Brent is becoming less efficient and the supplies are decreasing. According to the industry, the benchmark should now also include crudes from West Africa, Kazakhstan, Algeria, Russia and even the United States (Hume, 2014).

The production of Brent fell from 1.1 million barrels per day in February 2011 to 930'000 barrels per day in February 2014. In order to reverse the decreasing production, Norway is looking to develop new fields or to invest in current fields; however, this will take time (Hume, 2014).

The Brent futures and options are exchanged mainly on the ICE Futures Europe. However, the NYMEX also has its own Brent futures contract. One of the main differences between Brent and WTI is that the Brent crudes can be sent everywhere in the world on oil tankers, while WTI is only for American and Canadian usage. Consequently, the benchmark of Brent has more importance on the international markets (Campbell, Orskaug, Williams, 2006).

2.3.1.3 Main sources of information for crude oil markets

The most important public international source of data for the crude oil markets participants is coming from the Joint Organizations Data Initiative also known as 'JODI' (UNCTAD, 2011). The reports published by JODI are dealing with the production, refinery intake, exports, imports and inventory levels of crude oil. The organization is composed of seven partners, which are: the Asia-Pacific Economic Cooperation (APEC), the International Energy Forum (IEF), the Organization of Petroleum Exporting Countries (OPEC), EUROSTAT, the Latin American Energy Organization (OLADE), the United Nations Statistics Division (UNSD) and the International Energy Agency (IEA). In total about 90 countries participate in JODI, which represents about 90% of the global demand and supply of global oil. The report is free and is updated on a monthly basis (JODI, 2015).

Another source of data for the crude oil markets comes from the International Energy Agency (IEA) that releases a monthly report on the demand, supply, stocks and prices of oil. Moreover, the OPEC publishes a monthly report on the supply of crude oil. The publication is concerned with current problems that affect the market of oil worldwide, an analysis of the oil market trends and development of the demand, market balance and supply. On the national level, the Energy Information Administration realizes various analysis and estimation on the crude oil markets (UNCTAD, 2011).

On a private level, the industry uses the annual report of *the Statistical Review of World Energy* that is produced by British Petroleum and provides information on market trends. The Cambridge Energy Research Associates (IHS CERA) is advising many different markets players such as Governments or financial institutions on energy markets and industry trends (UNCTAD, 2011).

The pricing agency Platts is a global provider and regulator for the prices of the Brent physical market. Platts is evaluating the prices for physical cargoes of Brent crude oil as there are no reports of inventory or supply figures available weekly (Platts, 2015). Another agency called Argus also provides diverse business intelligence reports and studies on markets concerning the markets of energy, emissions and transports (UNCTAD, 2011). It is an independent media organization that is headquartered in London and that was founded in 1970 (Argus, 2015).

The American Petroleum Institute releases separate inventory reports filed with the Energy Information Administration as requested by the U.S. Government. The API also reveals information regarding the production of the five dominant products made with

petroleum that represent about 80% of the total production made in refinery. The report is published weekly every Tuesday afternoon. The American Petroleum Institute collects its information on a willingness basis from refineries operators, pipelines and bulk terminals (API, 2015). During the U.S. federal shutdown, the API released separated inventory data as normally scheduled (Rozhnov, 2013).

Oil traders usually find information by talking with a wide range of different people, from other traders to specialist journalists for oil trading. They have to analyze a lot of data. Everything can affect the prices of crude oil, such as national elections, wars or natural disasters. The main goal of the physical traders is to be able to sell for more and buy for less (Reuben).

This list is not exhaustive as there are many different sources, however, the most important ones are listed here.

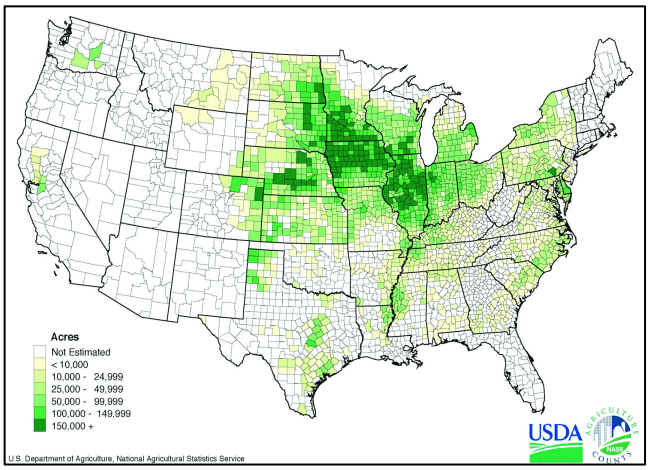
2.3.2 The corn market

2.3.2.1 Background information

This report focuses on the trade of corn in the United States and will explain what are the trade flows with the rest of the world. Corn is a cereal grain that is cultivated in North and Central America where there are warmer climates. The commodity is used mainly for livestock feed (pig and poultry), as well as, for food and industrial production. In the United States, corn is the primary feed grain and represents about 90% of the total feed grain production and use. Moreover, it is used to produce energy through the fabrication of ethanol; therefore the information coming from the markets are also very important for energy producers. The demand for ethanol production has been increasing over the years and that resulted in higher corn prices, which gave an incentive to farmers to produce more corn (USDA, 2015a).

The United States largely dominates the market and is the biggest producer and exporter of corn worldwide. In the year 2013-2014, the United States produced about 354 million tons of corn (USDA, 2015a). The exports, which amount to about 20% of the U.S. corn crop production, are representing a large source of the demand for the producers and account for a great net contribution to the agricultural trade balance in the United States (EPA, 2013). With this high export rate, the rest of the world has to align its prices on the North American market prices, which makes the other countries indirectly dependent on the production of corn in the USA (USDA, 2015a).

FIGURE 5 - U.S. CORN BELT



Source: USDA (2010).

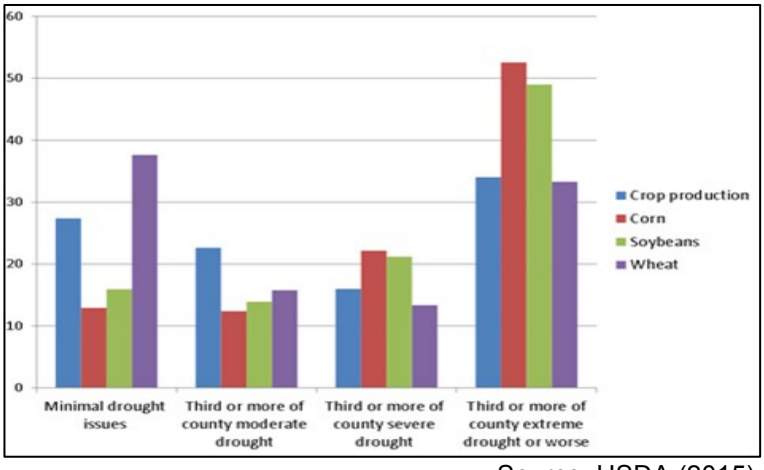
On this map, you can see the main production areas of corn in the USA.

The big influence of the market supply of corn in the USA makes the world prices of corn and trade dependent on the weather in the corn growing area of the United States (the U.S. Corn Belt). The grain is grown in most of the States throughout the country but the main production is condensed in the area of the Heartland (part of Illinois, Indiana, Iowa, South and North Dakota, Nebraska, Ohio, Kentucky and Missouri). The biggest producers of corn are the states of Iowa and Illinois and account for more than a third of the total U.S. crop production (USDA, 2015a).

2.3.2.2 Corn situation in the last years

The year 2010 has been bad for corn agriculture as the weather has been very hot and rainy at the same time. As a result, the country had low stocks of grains and supply was insufficient for demand for animal feedstock, ethanol production and exports. Moreover in 2012, the United States had its worst and most extended drought since the last 25 years. This event greatly affected the agricultural sector as much of the largest field crops of the Midwest were devastated or damaged resulting in a large increase in the prices. In total, about 80% of the lands used for agricultural purposes were drought during this year. Below in figure 6, we can see the severity of the drought in value terms for the main crops. According to the USDA, 49% to 53% of the value of the production was based in the areas that had the most extreme drought (USDA, 2015c).

FIGURE 6 - SHARE OF THE NATIONAL VALUE OF CROP PRODUCTION BY 2012 DROUGHT SEVERITY

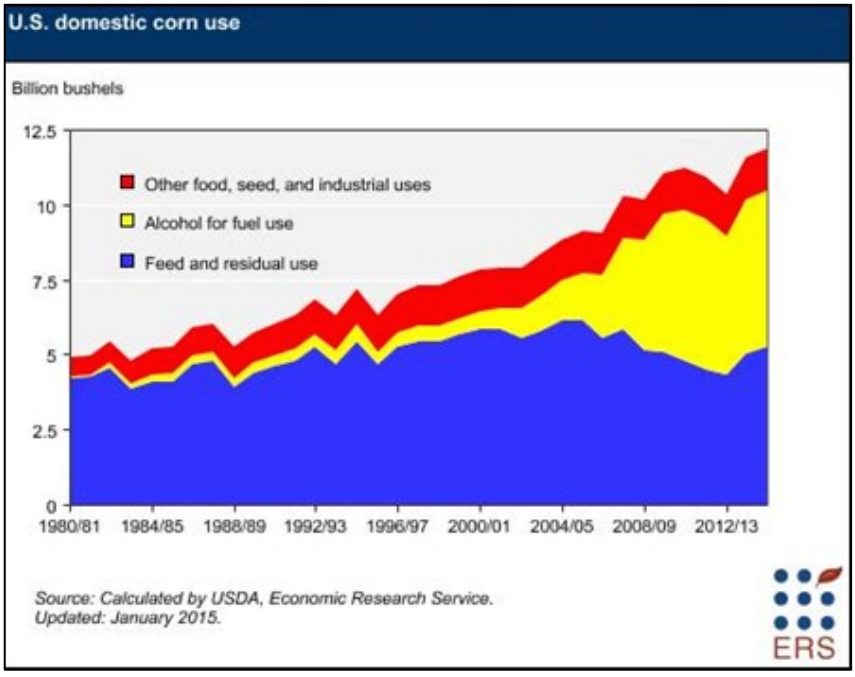


Source: USDA (2015).

The results were high corn prices until the middle of 2013. Starting at this period, the situation reversed and a high production was possible due to exceptionally good weather that improved soil conditions. As a consequence, the supply of corn in the United States has grown and the prices decreased sharply (USDA, 2015a). Corn is mainly traded on the *basis*, which means that it is traded on the difference between the spot price of corn and the relative price of the futures contract that has the shortest duration until it matures. The *basis* is different depending on the States in the USA and will mainly be based on the supply and demand. As a result, the States that produce the most grain will trade at a discount because there may have an oversupply of corn compared to the other states (CME, 2012).

The price of corn will differ and fluctuate throughout the seasons. During the growing season, there will be more volatility because the markets will have supply expectations, which can change significantly due to the weather and growing conditions of the grain. In the United States, the corn crops will typically be planted at the beginning of April and will grow until June. The harvest season will start in October and will finish at the end of November. The whole production of the United States represents about 39% of the world output (USDA, 2015a).

FIGURE 7 - U.S. DOMESTIC CORN USE



Source: USDA (2015).

On figure 7, we can see the U.S. domestic corn use. We see the evolution from the 1980's until the years 2012/2013. The use of corn for alcohol for fuel use increased greatly throughout those years.

2.3.2.3 Main sources of information for corn markets

As supply expectations are really important for the agricultural markets, it is crucial to have data on the plantings of crops and the harvest estimations (Fajarnes, 2011).

The specific data coming from the corn markets in the United States are coming from the Energy Information Administration and the United States Department of Agriculture, two federal agencies. The Congress of the United States created the EIA in 1977 as an independent statistic and analysis agency. Its main objectives are to give data and analysis that will permit appropriate political decisions to be taken and make the markets more efficient. The agency gathers information on prices, storage, consumption, production and other elements that will be published independently (EIA, 2015).

The USDA is a federal agency that is responsible for the policies on agriculture, farming and food and that was created in 1862. The agency publishes regularly forecasts on the situation of the markets of raw materials. Those reports are very important for the professionals active in the agricultural commodities trading sector as it is one of the most important global sources of information for the agricultural markets (UNCTAD, 2011). The large commodities trading companies use those reports to ensure that their own estimation are correct and fit the markets. As mentioned earlier, the most important report that is released by the USDA is the '*World Agricultural Supply and Demand Estimates'* (WASDE[4]) that is published monthly and creates a lot of volatility and activity on the markets at the time of its release (Interview with Bunge, 2015). The record releases information on the supply of grains, cotton and oilseeds in the USA and around the world. It also gives valuable information on prices and storage (USDA, 2015b). According the archives of the USDA, there was no report released in October 2013 due to the U.S. Government shutdown (USDA, 2015b). The figures coming from the United States are very important for the international markets as the USA are one of the main producers of several agricultural commodities such as cotton,

[4] You can find an example of this report at: http://www.usda.gov/oce/commodity/wasde/

corn or wheat. As a result, a change in the estimation of the production in the United States can strongly impact the markets globally (UNCTAD, 2011).

Finally, it is also worth mentioning that the USDA has enumerators that will gather crop samples around the USA in order to help estimate the harvest. Those employees were furloughed during the U.S. federal shutdown of October 2013, which was a big issue as a part of the corn production had already been harvested, meaning that they lost the chance to make final physical estimations of the production. The USDA had to find a solution to make up for the missing samples in order to produce a precise production report in November 2013. As the last three years were catastrophic for corn production, the estimations were crucial in 2013 to determine the supplies recovery (Polansek, 2013).

The Economic Research Service, which is a part of the USDA, offers an analysis on the different events that occur on the global and domestic corn markets and may have an impact on the supply, demand, prices and trade (USDA, 2015a).

For all the agricultural companies, the main international source of data is the Food and Agriculture Organization of the United Nations (FAO). It provides also with market analysis and controls the fundamentals of the markets. The information is published at various frequencies and can be consulted on the Internet (UNCTAD, 2011).

The AMIS namely Agricultural Market Information System gives information on the necessity commodities such as wheat, soybeans and maize. This association has been developed in order to avoid potential 'food panic' that occurs in some countries during time of turmoil and that are due to the lack of information. A bulletin is now published ten times a year and gives information on international market situations. The aim is to improve the market transparency (Interview with Mr. Nkurunzia[5], 2015).

Another source of international data with a focus on grain comes from the International Grains Council (IGC) that releases many information on the grain markets. The IGC releases monthly report and analysis that are, for the most part, not publicly available (Fajarnes, 2011).

The list is not exhaustive as there are many different sources, however, the most important ones are listed here.

[5] See Appendix 5: Interview with Mr. Janvier Nkurunzia, Chief of the Commodity Research and Analysis Section at United Nations Conference on Trade and Development, Geneva, May 20th 2015.

3. The US Government shutdown of October 2013

3.1 History / context

The federal Government shutdown of the United States that occurred from the 1st of October until the 16th of October 2013 was the most significant and the second longest in the history of the United States. The previous shutdown had occurred from December 16th 1995 until January 6th 1996 under the governance of Bill Clinton and lasted for 21 days (The Executive Office of the President of the United States, 2013)[6].

FIGURE 8 - BANNERS ANNOUNCING THE U.S. SHUTDOWN IN OCTOBER 2013

Source: IBT (2015).

6 The political system of the United States can be described as follow: The Congress represents the bicameral legislative section of the country and is divided into two houses. The upper house is called the Senate and the lower house is the House of Representatives. The upper house is elected for a 6-year period, which allows the representatives to see the long-term results of their legislation. The Senate has 100 seats and each state has two seats that are distributed among the Republicans, Democrats and Independents. The Vice President of the USA is the President of the Senate. The lower house has a faster impact than the Senate because each member has only a 2-year term. The house is composed of 435 voting members, 6 non-voting members, 1 resident commissioner and 5 delegates distributed among Republicans and Democrats. The seats are allocated based on the population of each state so that a state with more inhabitants will have more seats on the House of Representatives (The White House, 2015).

The lower house basically decides most of all the revenue-based legislation. The Senate will take the decisions regarding the endorsement of foreign treaties and cabinet designation (The White House, 2015).

The Constitution of the United States dictates that the spending of the Government has to be approved by bills passed at the Congress. The laws that set the spending of the Government are called the appropriation legislation. There are many agencies and programs whose funding depends on the annual appropriation acts. If the Congress and the President are not able to reach an agreement on those capitals before October 1st, which represents the beginning of the new fiscal year, there are two possible issues:

1. The first one is the enactment of interim continuing resolutions that will extent the funding for a temporary period until a final decision is made;
2. If no agreement can be reached, a funding gap will occur, therefore leading to a shutdown of certain Government activities.

A funding gap occurs when federal agencies are in need of funding after the expiration of their annual or interim allowance. It is basically the interval of time during which there are no appropriations acts enacted for certain activities or agencies. If the Government is not able to find more funding in a timely manner in order to continue its operations, it must stop them, except in some situations allowed by the law (Brass, 2014).

The shutdown of the American Government resulted in thousand leaves of absence of federal employees and a decline or a cessation of some activities. The departments that are affected by the shutdown are determined on a set of intricate criteria. The legal framework for the Government shutdown is governed by the U.S. Constitution, court decisions, and statutory provisions, as well as, by the Department of Justice. More specifically, it is governed by the Antideficiency Act[7], which can be found under the Title 31 of the U.S. Code and that determines which departments and programs will continue or resume their activities in the case of a shutdown. The Act generally forbids the agencies to continue their operations as long as no funding appropriations are made. The agencies that do not respect this act risk criminal sanctions or fees (Brass, 2014).

This legislation allows exceptions only if: "...some reasonable and articulable connection between the function to be performed and the safety of human life or the protection of property..." and "...some reasonable likelihood that the safety of human life or the protection of property would be compromised, in some degree, by delay in the performance of the function in question..." (Brass, 2014).

[7] See Appendix 1: Antideficiency Act.

The executive branch agencies are prepared for an eventual shutdown through an annual circular *No. A-11* published by the Office of Management and Budget. This booklet instructs them on how to prepare and operate in the eventual case of a funding gap. A plan has to be prepared and approved by each agency that will later present it to the Management and Budget Office every two-year. The shutdown plan will contain a summary of the activities that will either continue or stop during the shutdown, provide a time estimation to start the closing of the activities and details on the number of employees that will either be furloughed or will continue their activities (Brass, 2014).

The shutdown was mainly related to the fact that the politicians did not agree on the Obamacare[8] funding; however, another worry for the markets was the fact that the congress would not agree on a new debt ceiling. A default would have had catastrophic consequences and bring down the economy. The consequences would have been a loss of value in the dollar, an increasing volatility, the increase of the interest rates and even a potential financial crisis (U.S. Department of the Treasury, 2013).

8 The Obamacare is a US law that wil reform the American health care system. The main goal is to provide an access to affordable health insurance to more Americans. It will also improve the quality of the health care and insurance, as well as, reduce the health care spending in the United States.

3.2 Causes of the government shutdown of October 2013

The United States Government entered into a shutdown on October 1st 2013, which is the first day of the new federal fiscal year in the USA. The reason of the closing lay in the fact that the Congress was unsuccessful in enacting a bill funding the federal Government for the fiscal year 2014 after the funding for the previous fiscal year ceased. The House of representative on one side and President Obama with the Congress on the other could not agree on a resolution. At the House of Representatives - led by Republicans at this time - the Republicans tried to delay or cancel the commonly named "Obamacare" system, officially named as the *Patient Protection and Affordable Care Act*. On the other hand, the Senate - which was led by the Democrats - tried to pass a resolution to maintain the current funding with no more conditions. The new budget became therefore a deadlock that threatened the economy of the country (Brass, 2014).

The Center of the problem was the bill called *"Continuing Appropriations Resolution of 2014"* that was passed by the House of Representatives on September 20th 2013 and which had to go to revision at the Senate. This bill was passed with the goal to defer a part of the Affordable Care Act - or Obamacare -. On September 27th 2013, the Senate removed the measures related to this act. On the 29th of September 2013, the House of Representatives restored the crossed measures and passed the bill again. At this point, the two Houses could not find an agreement, which lead to the federal shutdown starting on October 1st 2013. The result of this non-agreement was that there was an absence of funds at the start of the new fiscal year of 2014 (Brass, 2014).

The Treasury Department of the United States informed that it would not be able to borrow more money after October 17th 2013 unless the debt ceiling of $16.7 trillion was increased by action of the Congress (Brass, 2014). The cash reserves on October 15th 2013 were of $36.5 billions, which would have allowed the Department to cover the debt until more or less November 6th 2013. However, with the uneven revenues fluctuations, experts predicted that the United States would not have been able to pay their bills anymore starting sometime during the period of October 22nd and October 31st 2013 (Garcia, 2013). The situation returned to normal on October 16th 2013 after a 16 full days shutdown. At this date, the Congress found an agreement and an interim bill was signed, therefore ending the federal closing (Brass, 2014).

3.3 Financial and economic impact of the shutdown

The financial and economic consequences of the shutdown were important for the United States. During the sixteen days of closing, most of the ordinary operations of the Government were not accessible. The closure had negative impacts on the economy, the budget and the Federal workforce. The biggest direct cost concerned the Federal employees leave of absence as they were paid for sixteen days of work not performed. The Executive Office of the President of the United States estimated that the total cost of salary due to the furloughed of employees during the closing reached $2 billion. A total of about 800'000 employees from the Federal administration were furloughed. Moreover, about 1.2 million had to go to work, without knowing when they would get paid. Every federal employee has been compensated since the shutdown but this process was expensive and time consuming. Some services continued to be fulfilled such as mail delivery and the issue of Social Security and Medicare benefits (The Executive Office of the President of the United States, 2013).

Another impact on the economy is that fewer jobs were created in the private sector during the time of the shutdown, which had negative consequences. Furthermore, the closing caused: a delay in the handling of transportation and energy projects, a slow down in trade, a disrupted tourism and travel in national parks, a delay in the delivery of aircraft purchases and Food and Drug Administration approval of drugs and medical instruments (The Executive Office of the President of the United States, 2013).

The main sector that suffered was tourism. Many national parks have been closed during this period such as Grand Canyon and Yellowstone National Parks, which resulted in great financial losses. It has been estimated that about 700'000 visitors per day could not go to the parks and that about $76 million of revenues from visitors spending have been lost daily (The Associated Press, 2013).

Finally and most importantly, the shutdown deprived businesses from very important information on the state of the economy. This lack of information concerned macroeconomic and microeconomic data, as well as, specific information needed by the market participants active in the trade of commodities. In this domain, the closing had the consequence to stop the flow of data used by the physical traders to bet on the markets.

Regarding the agricultural markets, the National Agricultural Statistics Service had to postpone the release of farm wage reports, as well as, data publications (The

Executive Office of the President of the United States, 2013). Moreover as seen earlier, the Government stopped releasing important information on the state of the harvest and on the exports and imports of commodities (Wexler, 2013).

Reports from the U.S. Energy Information Administration giving information on the oil supply and demand every week had to stop publishing during the shutdown for the first time since 1979. The result was that it was hard for physical traders to determine the prices of the commodities as they are based on supply and demand. The market participants had to rely on private sources or figures that were previously released in order to make their decisions (Wexler, 2013).

Market participants and actors had to take some decisions to secure their investment or funds. For example, the CME group had to prepare for the eventuality of defaults by asking their clients trading US interest rate swaps to deposit more money in order to be able to absorb potential losses (Foley, Hall, Crooks, 2013). The main fear was related to the length of the shutdown as, the longer it would last, the more uncertain would be the reaction of the markets at its reopening. The traders in general were scared that there would be violent prices movements, especially possible if the actual inventories did not match the estimations made by the markets (Wexler, 2013).

Around the world, the consequences of the federal shutdown in the United States created economic uncertainty and discouraged foreign investors. As a matter of fact, the financiers worldwide were really concerned to see that some politicians preferred to disrupt the entire trade system by preferring a shutdown to an agreement on the allocation of the funds. The lack of compromise among the politicians that created this situation resulted in a slowdown in economic growth (Morgan, 2013).

4. Impacts of the U.S. Government shutdown on commodities trading

In order to find out more about the impact of the U.S. Government shutdown of October 2013 on the trade of crude oil and corn, this report analyzes the differences between the spot prices of those commodities in the last five years. The prices of the commodities changed during the first week of October 2013 as the traders and the markets responded to the shutdown. This was mainly true for the spot prices as uncertainty created volatility (The Dawn, 2013).

To the extent of conducting the analysis, the prices of the WTI and Brent crude oils were gathered from the Energy Information Administration and plot into charts that show the correlation and different patterns between the years. The same experiment was also made with the corn spot prices of the last five years that were taken from Indexmundi.

Moreover, the numbers of futures contracts traded of WTI and corn will also be examined in order to see whether the closing of the federal administration had consequences on the trade volume. The data regarding the futures prices of corn and crude oil for the year 2013 were unfortunately not publicly available. Therefore, only the traded volumes will be analyzed in order to determine whether, as mentioned by professionals from the commodities trading field, there was less volume traded during the time of the shutdown.

According to a specialized financial press agency, the shutdown did not have a major price impact but it did decrease the volume traded on a few markets because the sources for alternative data of information were not or rarely available (Wexler, 2013). The data on the trade volume were taken from the report *'Commitments of Traders'* published by the Commodity Futures Trading Commission (CFTC) and analyzed based on the different positions taken by the various markets participants.

4.1 Markets fundamentals overview

The market participants have the option to buy a commodity today on the spot markets and store it, resulting in storage and opportunity costs. They can also buy the commodity on the futures markets for later delivery at the expiration of the contract (UNCTAD, 2011). Moreover, the trading of commodities is made up of physical and derivatives trading as can be seen on the table below (The City UK, 2011):

TABLE 1 - DIFFERENT TYPES OF COMMODITIES MARKETS

	Exchange trading (standardized contract sizes and maturity dates)	OTC trading (individually tailored)
Physical trading	Accounts for a small proportion of trading on exchanges. It is typically used to balance out an excess of demand or supply on the physical market.	Accounts for most OTC trading. Participants include farmers, refiners, and wholesalers. Trading is done on the spot and forwards markets and is delivery based.
Derivatives trading	Accounts for most of the trading on exchanges. Traders include hedgers, speculators and arbitragers. Dominates soft commodities' trading.	Precious metals and more recently energy contracts are often traded through OTC derivatives markets.

Source: The City UK (2011).

As we can see above on table 1, commodities are traded either on the organized exchanges or on the over-the-counter (OTC) markets depending on the requirements of the physical traders. OTC markets offer more flexibility as they offer "tailor-made" contracts. On the other hand, futures exchanges offer standardized contracts with precise requirements regarding their quantity, quality and point of delivery (UNCTAD, 2011).

Futures exchanges offer greater transparency than OTC markets as well as more liquidity due to the large amount of volume traded. Moreover, there are less counterparty risks as the deposit of an initial margin and a margin call limits the exposure (UNCTAD, 2011). Every exchange has a clearinghouse that acts as the

connection between the buyers and the sellers and where the market participants will deposit their margin. The members have to maintain sufficient amounts of money to cover their debit balance. The clearinghouse is responsible to fulfill the contracts of all their members. This method simplifies the futures trading as there is a huge amount of transactions made everyday and it would be impossible to deal directly with one another (Lerner, 2000).

When the commodities are traded on the futures markets, there are two main situations than can happen. If the futures prices are greater than the spot prices and the cost of carry* together, there will be a motivation to buy the good on the cash market and counterbalance with a short position* in the futures market until the prices adjust and both prices are equal.

On the contrary, in the case of a future price that is lower than the spot prices, the participants will sell the commodity on the spot markets and then enter into a long position* on the futures market (UNCTAD, 2011).

If the forward curve is going in an upward position, the market is said to be in a contango. This situation occurs when there are a lot of stocks available and results in the price of the futures being higher than the cash price. This can be explained by the fact that the capacity of storage for the commodity has limitations and that the costs of storage increase with the level of stocks. For the physical trader, it is an incentive to sell the commodity on the cash market.

On the other hand, if the futures prices are lower than the sport prices, the market is in backwardation. In this situation, the prices of the futures are not sufficient to cover the cost-of-carry. This occurs when the stocks are low (UNCTAD, 2011).

For the market participants, the choice between the sources of information is difficult as it may impact their risk measurement, calculation and position reporting. The most important for the physical trader is to first understand how and to what extends he will have to use the forward curve. Later, he will have to understand the limitations and methodologies of each source. Finally, the trader has to match his business needs with the most appropriate source of information (Platts, 2012).

In the next table, we can see that all the providers of data use different and specific methodologies that all have their own limitations.

TABLE 2 - SOURCES OF INFORMATION FOR THE FUTURES MARKETS OF OIL

Provider type	Typical Methodology	Methodological Limitation
Publishers	Combined multiple sources of market data topoproduce forward curves (e.g. exchanges, brokers, commercial and back office groups of market participants) Independent of market participants	Methodology used to model certain transactions may not be readily available or transparent Timeliness of data delivery may be a challenge for companies requiring end of day risk reporting
Exchanges	Quoted market prices for traded markets Margin-based settlements for non-traded markets	Does not typically capture OTC transactions May trade strips instead of individual months Does not capture illiquid points
Brokers	Aggregated price indications from dealer markets	Indications do not always indicate market trades May indicate strips instead of individual months Does not capture illiquid points
Data distributors	Exchange-based data feeds Data vendor aggregation Quantitative models	May not have control over data vendor methodologies May not disclose which curves and tenors are market-based and which are model-based.
Consensus curve publishers	High trust in data as member participates in aggregation	Usually available on a monthly basis and only reflects activities by reporting entities as opposed to the broader market
Internally developed curves	Trader assessments Quantitative models	Traders may reflect book bias Models may not be consistent with industry practice Models may be miscalibrated May not match market quote

Source: Platts (2012).

This table represents the different sources of information provided for the physical traders working on the futures oil markets. Every provider uses a different methodology to gather the data.

4.2 Effects of the shutdown on the U.S. crude oil markets

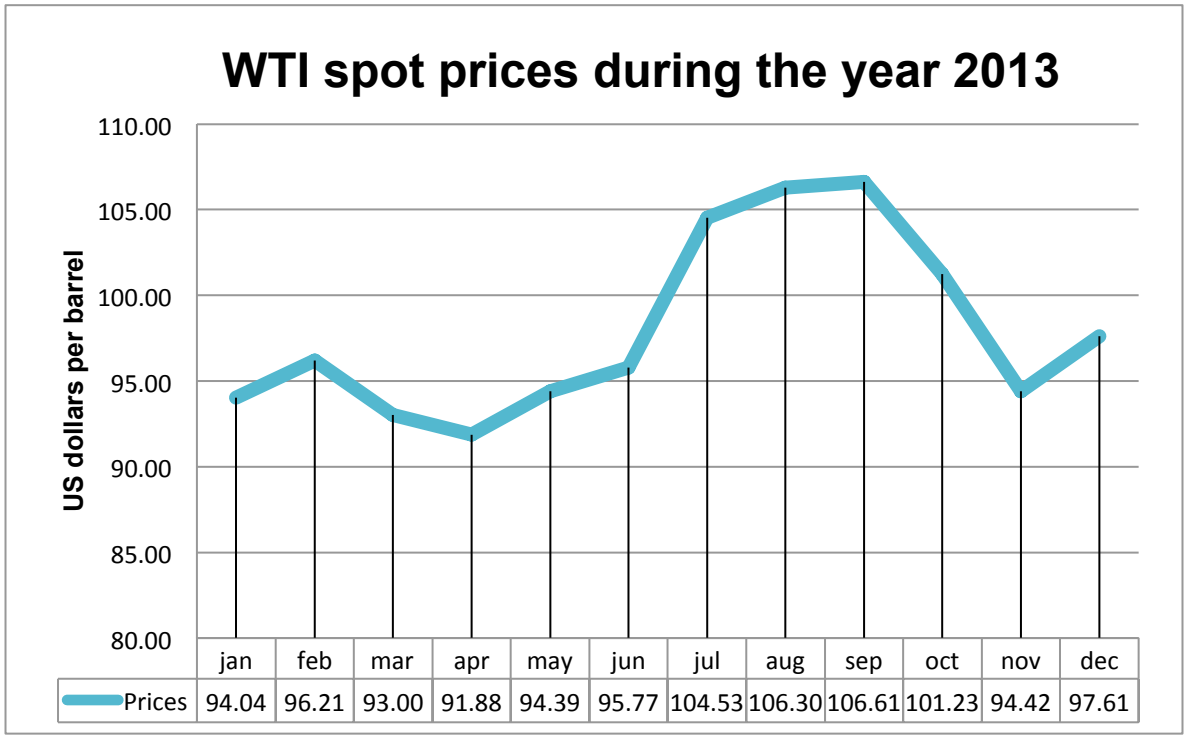
According to the Organization of Petroleum Exporting Countries, the U.S. Government shutdown only had limited consequence on the price performance of the commodities; however, the issue regarding the raising of the debt ceiling might have had a bigger effect. A prolonged uncertainty would have weakened even more the already depressed American economic recovery at that time (OPEC, October 2013).

4.2.1 Analysis on the West Texas Intermediate crude oil

4.2.1.1 Impact on the spot market of WTI

The analysis of the spot prices of the West Texas Intermediate crude oil from September 2012 until October 2013 demonstrates a great increase in prices starting in mid-June 2013 followed by a decrease in October 2013. A few days before the shutdown, on September 27th 2013, the price of WTI per barrel was $103.10 compared to $106.22 per barrel one week earlier, which shows a decrease of 3.09% (EIA, 2015).

FIGURE 9 - WTI SPOT PRICES IN US DOLLARS PER BARREL IN 2013



Source: EIA (2015).

According to the interviews held with physical traders, the fluctuations in prices are not only related to one factor but to different price drivers on the same time. The fact that the reports from the Government were not released in October may have affected the prices, but there were other factors playing a role at the same time. There is not only an automatic link to the data released (Interview with Mercuria, 2015).

TABLE 3 - WTI CRUDE OIL SPOT PRICES IN US DOLLARS PER BARREL FROM SEPTEMBER TO NOVEMBER 2013

September 2013	End date	Value (in US dollars per barrel)	Percentage change	Changes from week to week
Week 1	06.09.2013	$108.77	100%	0
Week 2	13.09.2013	$108.36	99.62%	-0.38%
Week 3	20.09.2013	$106.22	97.66%	-1.97%
Week 4	27.09.2013	$103.10	94.79%	-2.87%

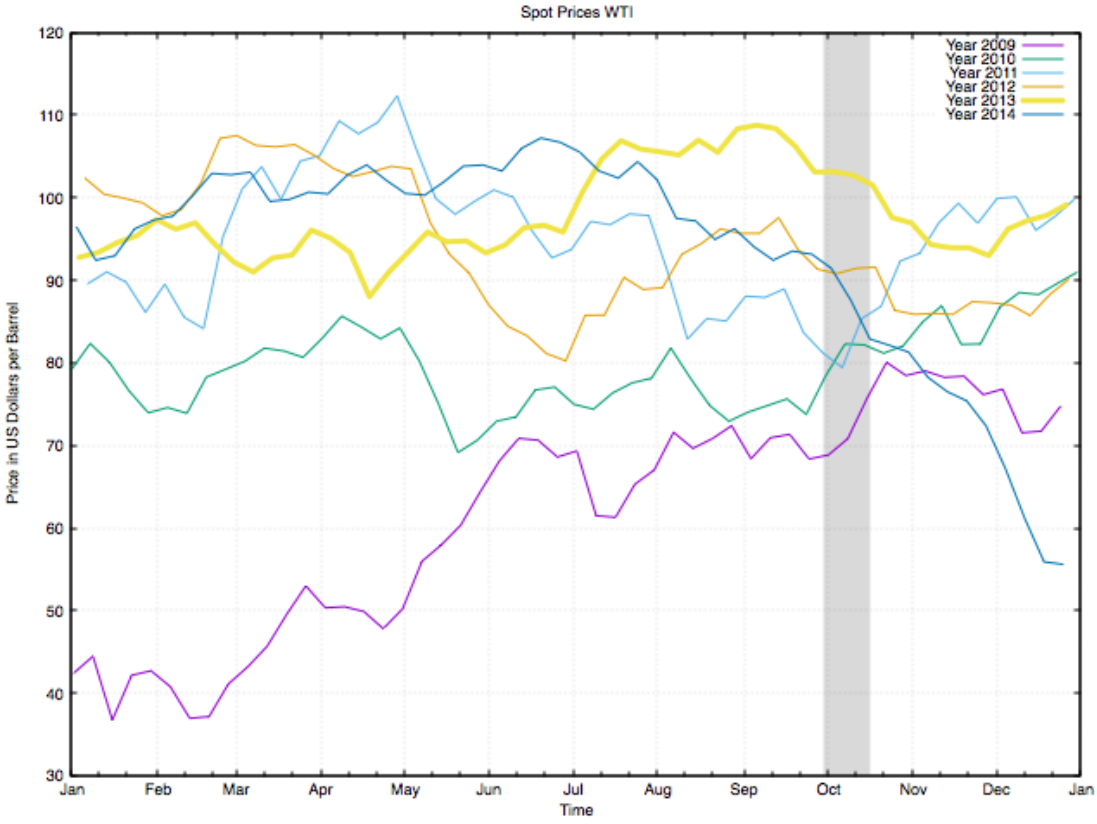
October 2013	End date	Value (in US dollars per barrel)	Percentage change	Changes from week to week
Week 1	04.10.2013	$103.14	94.82%	+0.04%
Week 2	11.10.2013	$102.70	94.42%	-0.40%
Week 3	18.10.2013	$101.51	93.33%	-1.09%
Week 4	25.10.2013	$97.57	89.70%	-3.62%

November 2013	End date	Value (in US dollars per barrel)	Percentage change	Changes from week to week
Week 1	01.11.2013	$96.94	89.12%	-0.58%
Week 2	08.11.2013	$94.31	86.71%	-2.42%
Week 3	15.11.2013	$93.94	86.37%	-0.34%
Week 4	22.11.2013	$93.92	86.35%	-0.02%
Week 5	29.11.2013	$92.97	85.47%	-0.87%

Source: EIA (2015).

On the table above, we can see the decrease in the spot prices of the WTI crude oil starting at the beginning of September until the end of November 2013, with a total decline of about 14.53% during this period. As mentioned earlier, there are many factors susceptible to provoke volatility in the markets. Therefore, it is hard to imply that the changes in prices are due only to the Government shutdown, even though it may certainly have played a role in the volatility at this period of the year.

FIGURE 10 - YEARLY SPOT PRICES OF WTI IN US DOLLARS PER BARREL FROM 2009 TO 2014



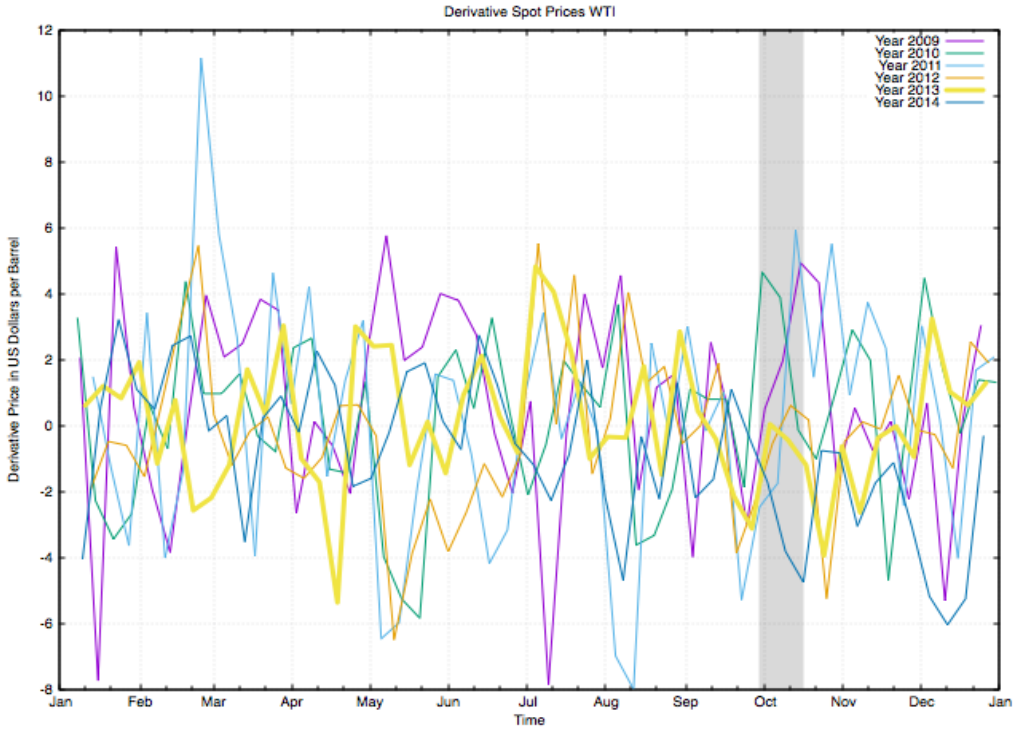
Source: EIA (2015).

Above is a graph representing what happened during the last five years on the spot prices of the WTI crude oil. To start with, we can say that the markets have been pretty volatile over the years. The year 2009 was probably the more changeable as we see a big decrease between January and December of this year. This graph also shows a great decrease in prices in the year 2014 as it started at about $98 in January and decreased to about $55 the next year in January 2015, which shows a decrease of almost 50% over the year.

Our focus is on the period represented in the grey area, which symbolizes the two weeks of October during which the shutdown occurred in 2013. In order to compare the situation with this year, it is important to see which patterns did the WTI crude oil follow during the other years. We notice that this varies greatly. In 2009, 2010 and 2011, the prices of WTI increased during the month of October. We can see a change during the year 2012, where the prices were less volatile and more or less stable during this period. However, starting in the year 2013, during the shutdown, we see that the prices actually changed direction and decreased during this period. This shows a reverse in the patterns of prices of WTI.

In the figure below, we can see the derivatives spot market prices of the West Texas Intermediate from 2009 to 2014. For every point in time (t), the value of the previous day was subtracted (t-1). This graph permits to take a closer look at the volatility patterns of the last five years.

FIGURE 11 - DERIVATIVES SPOT PRICES OF WTI FROM 2009 TO 2014



Source: EIA (2015).

On figure 11, we see that the prices increased slightly at the beginning of the U.S. shutdown and decreased afterwards. This figures shows some volatility at this period; however, nothing of great significance compared to the other years.

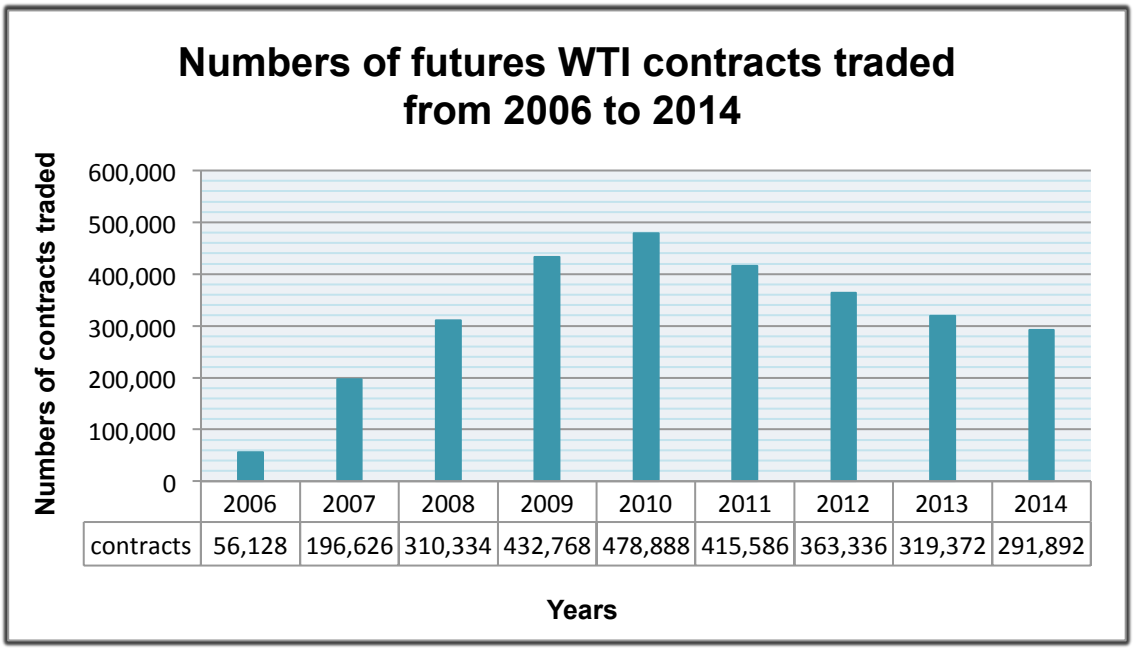
4.2.1.2 Impact on the futures markets of WTI[9]

The West Texas Intermediate futures are traded on the New York Mercantile Exchange, which is the largest physical commodity futures exchange in the world. This part of the report will focus on the analysis of the volume traded during the U.S. shutdown of October 2013 in order to see whether there was fewer contracts traded at this time compared to the last years. Only the futures markets will be analyzed. The report *'commitments of traders'* of the U.S. Commodity Futures Trading Commission gives us the number of open interest* for each week traded during the month.

A monthly average was calculated from the weekly data. Each open interest implies two contracts: one sale contract and one purchase contract. The agreements are made through the clearinghouse that plays the role of intermediary. As a result, the number of open interest has to be multiplied by a factor of two in order to discover the final amount of contracts traded.

Figure 12 demonstrates the numbers of WTI futures contracts that were traded and recorded by the CFTC from the year 2006 until 2014. It is peculiar to see a net decrease in the numbers of the futures contracts traded.

FIGURE 12 - NUMBERS OF FUTURES WTI CONTRACTS TRADED FROM 2006 TO 2014

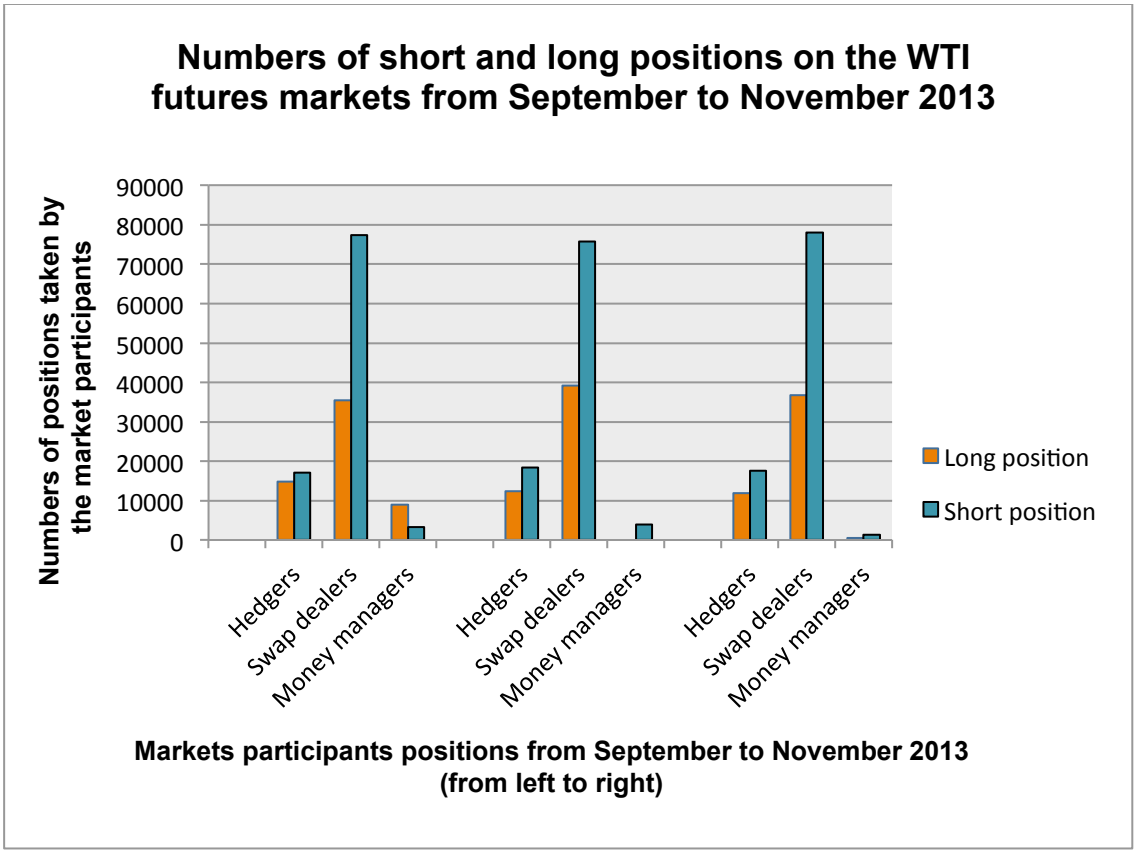


Source: CFTC (2015).

[9] The futures contracts specifications for the WTI crude oil traded at the NYMEX can be found under the Appendix 6.

Furthermore, the WTI *'disaggregated commitments of traders'* for all the futures combined positions were analyzed for the year 2010 to 2014. As mentioned earlier, the disaggregated data permits to see in more details what happened in the three main categories of market participants: the producers / merchants / processors / users; the swap dealers and the money managers.

FIGURE 13 - POSITIONS HELD BY THE PARTICIPANTS ON THE FUTURES WTI MARKETS FROM SEPTEMBER TO NOVEMBER 2013



Source: CFTC (2015).

The figure above shows us the numbers of long and short positions that were taken by the different market participants during the period from September until November 2013.

The differentiation between the three main classes of players active on the markets allows for a better transparency and market efficiency. The specific data regarding the types of positions for each category and the periods are represented below in the table 4:

TABLE 4 - MARKET PARTICIPANT'S POSITIONS ON THE WTI FUTURES MARKETS FROM SEPTEMBER TO NOVEMBER 2013

September 2013				
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers[10]	14,836	17,023	31,859	Net short 2,187
Swap dealers	35,477	77,415	112,892	Net short 41,938
Money managers	8,924	3,226	12,150	Net long 5,698
October 2013				
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers	12,337	18,452	30,789	Net short 6,115
Swap dealers	39,147	75,686	114,833	Net short 36,539
Money managers	0	3,962	3,962	Net short 3,962
November 2013				
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers	11,919	17,574	29,493	Net short 5,655
Swap dealers	36,802	78,061	114,863	Net short 41,259
Money managers	516	1,283	1,799	Net short 767

Source: CFTC (2015).

If we analyze in depth the positions and movements of each participant we can see that:

1. The group of hedgers decreased its long position throughout the months and increased its short position during October to later decrease them in November. Over the three months, we see that this category is always in a short net position. This category wants to sell at the higher prices possible and don't take risk

[10] This category includes the producers, users, merchants and processors.

exposure. In order to reach a short net position, they sell futures and are long the physical. There is evidence that the market participants that have interest in the physical commodities are engaging much more into net short positions, while the financial investors usually enter into net long positions (UNCTAD, 2011).

2. We saw that the group of swap dealers works with swaps and utilizes the futures markets in order to help them control and hedge the risks that they take with their swaps transactions (Campbell, Orskaug, Williams, 2006). They are part of the group of hedgers (UNCTAD, 2011). It is therefore logical that they held a short position in October 2013. In the swap markets, there is no physical delivery as when the swap matures there is only an exchange of cash flows. Those are simply financial instruments that are usually traded on the OTC markets and offer tailor-made contracts. The market participants that are hedging prefer to deal with swaps because those offer a full protection against adverse physical price movements (Platts, 2010).

3. The money managers had a net long position in September but moved towards a net short position in October and November 2013. The shutdown may be a factor for this movement as it was riskier for them to trade during this period. Moreover, they decreased greatly the amount of positions that they had on the markets.

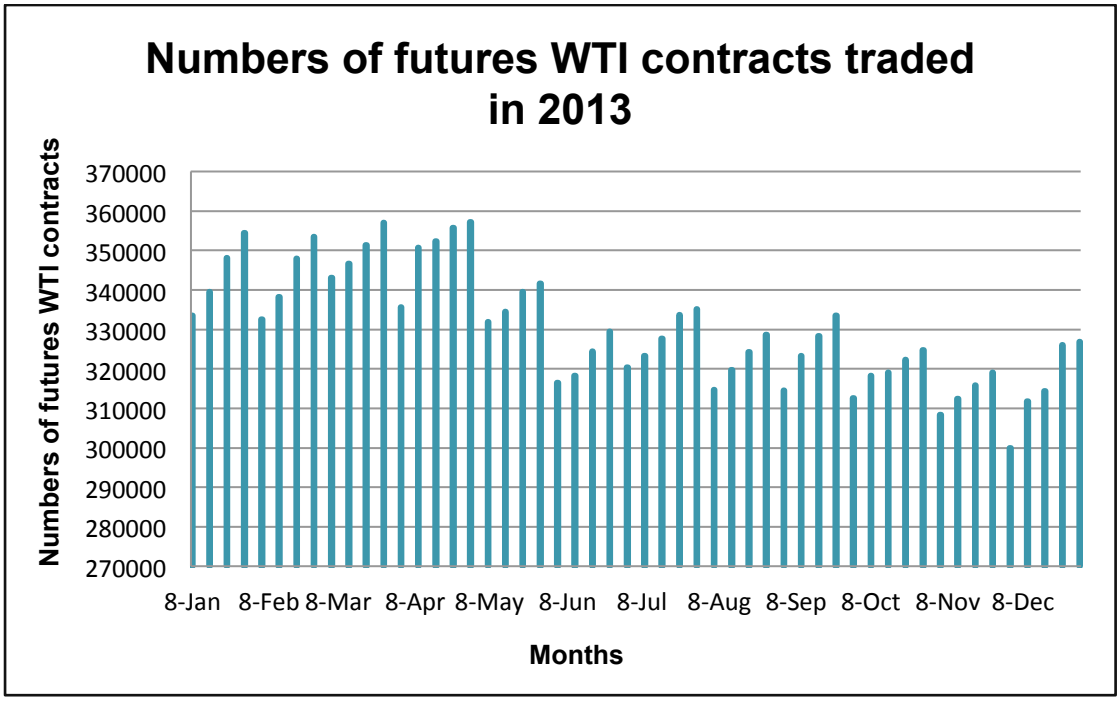
Regarding the numbers of contracts traded during this period, we notice that the group of hedgers decreased its number of contracts traded by 2'366 from the beginning of September until the end of November. On the other hand, the swap dealers did increase their contracts position by 1,971. Finally the money managers decreased greatly their position from 12,150 contracts in September to 1,799 contracts in November 2013. We see therefore that there was indeed less volume traded throughout the months. The only exceptions being the swap dealers that traded more contracts but this balanced the market.

If we compare the numbers of positions hold over the last five years in October by the markets participants[11], we can see that the numbers of open interests tend to decrease over the years. Moreover, the hedger's category is decreasing both its long and short positions over the years. On the other hand, the swap dealers tend to increase their short positions. Finally, the money managers held long positions over the years with the exception of the year 2013, where they had more short positions.

[11] You can find the amount of short and long positions taken by the markets participants on the WTI futures markets from 2010 to 2014.

On the next figure, we can see that the volume of contracts[12] traded did decrease throughout the year 2013. The month of October has seen less volume than in September 2013. On September 30th 2013, the total volume traded of all futures was about 27% under the average of 100-days. The volume traded at the Nymex was of 466'571 contracts on September 29th 2013, which was 24% below the average of the last three months (Shenk, 2013). The trend seemed to continue in November before an increase in the volume of contracts traded during the month of December 2013. Every year is particular as there may be all kinds of events that may have an impact on the prices and the amount of WTI traded.

FIGURE 14 - NUMBERS OF FUTURES WTI CONTRACTS TRADED IN 2013



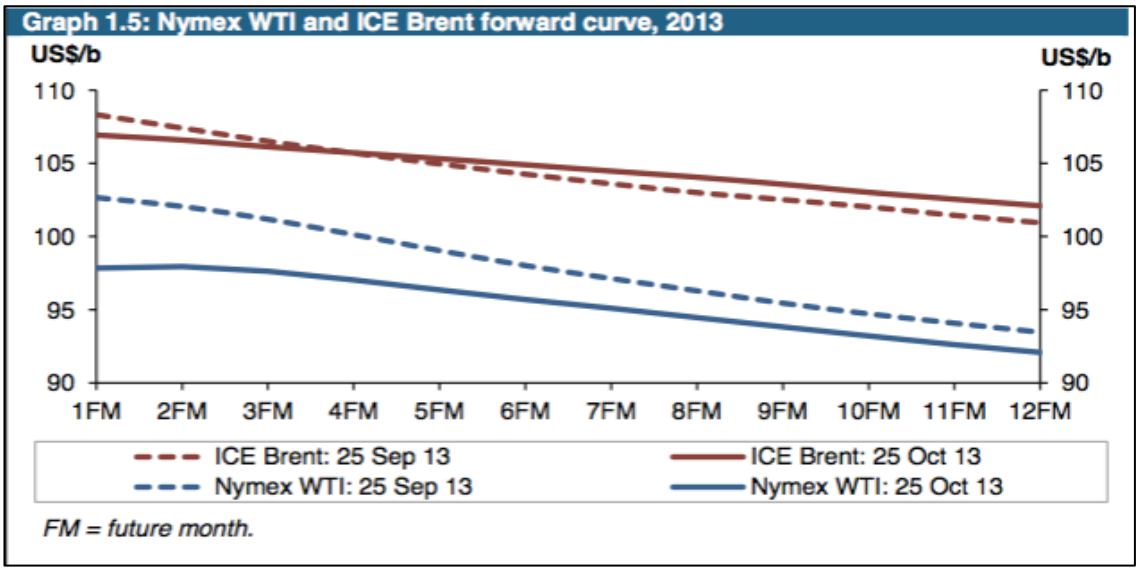
Source: CFTC (2015).

Regarding the forward curves during the shutdown, we may say that, according to the figure 15, the future curve of the WTI traded in the NYMEX in September and October 2013 is in backwardation, meaning that the futures prices are lower than the spot prices. This can be attributed to different factors: the prices of the front month contracts have increased due to geopolitical events and a high refinery demand for the season. Moreover, the production of crude oil in the United States has increased greatly from 2012 (6.5 million of barrels per day) to 2014 (8.4 million of barrels per day), which drives the prices in a downward trend (EIA).

[12] You can find the numbers of open interest and contracts traded of WTI for the year 2013 under Appendix 9.

On the other hand, the backwardation in the Brent contract between the first and second months has eased over the month due to less tightness in supply. This is due to the fact that more Libyan production came back on the markets and that there was a decrease in the geopolitical tensions at this period. The WTI backwardation remained almost stable as well because stocks were continuously drawn from Cushing and more infrastructure capacity were becoming available (OPEC, 2013).

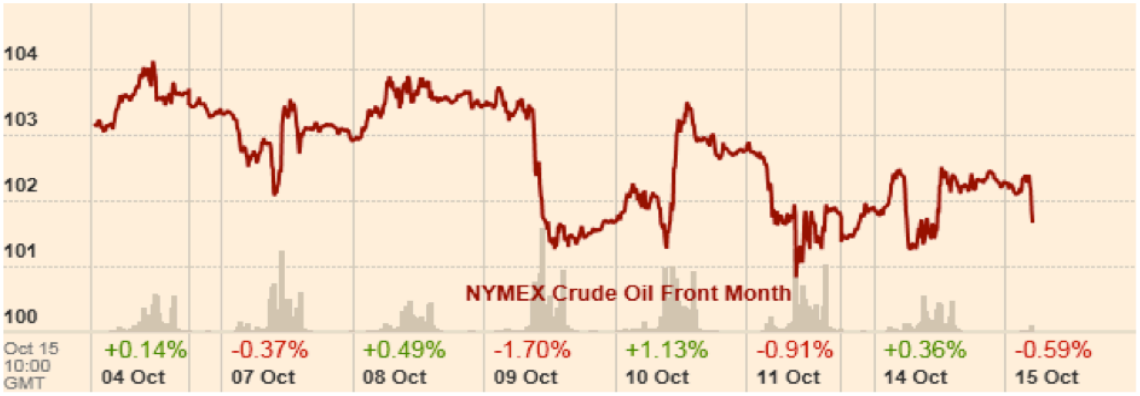
FIGURE 15 - NYMEX WTI AND ICE BRENT FORWARD CURVE SEPTEMBER AND OCTOBER 2013



Source: OPEC (2013)

On the next figure, we can see the NYMEX crude oil futures front month of October 2013. We notice that the price of the WTI futures front month has been less volatile during the first days of the shutdown than at the end. The prices remained more or less stable until the 9th of October 2013, date at which the futures front month plunged by 1.70%.

FIGURE 16 - NYMEX WTI CRUDE OIL FRONT MONTH OCTOBER 2013



Source: Financial Times (2013).

Other significant geopolitical events occurred at the same time of the budget dispute, such as the war situation in Syria. Moreover, at the same period, there was a net increase in the U.S. crude oil stocks due to the shale revolution, which might have influenced the futures prices as well.

4.3 Effects of the U.S. shutdown on the international oil markets

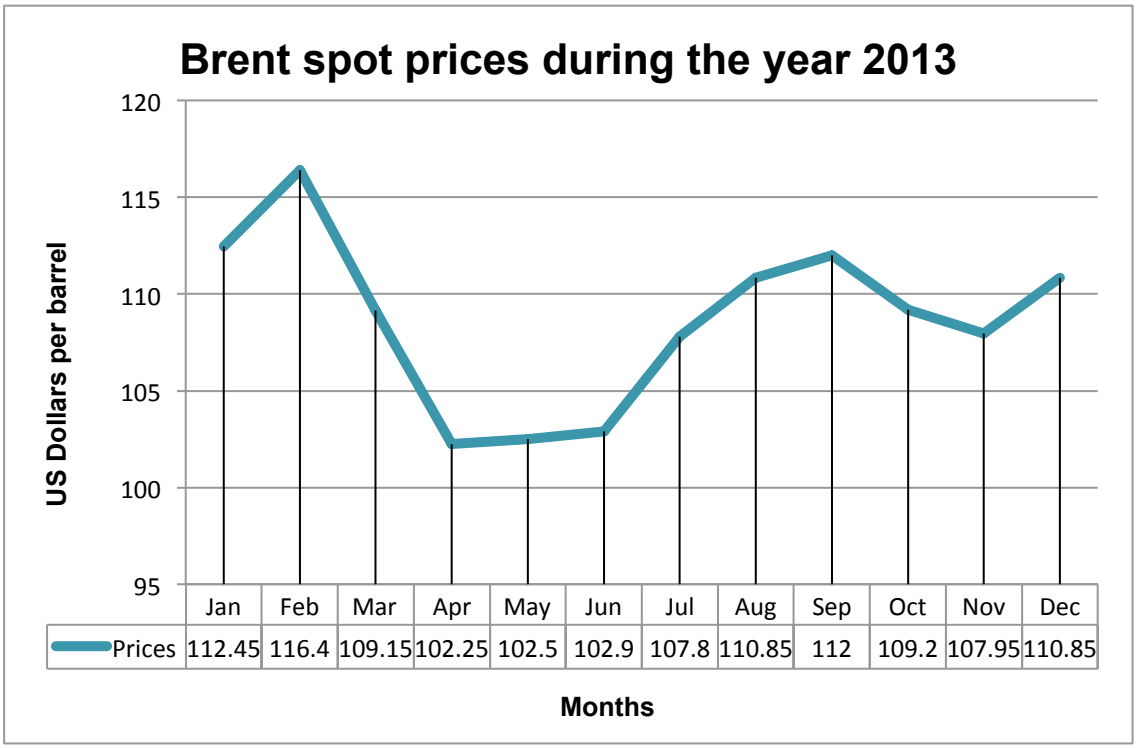
4.3.1 Analysis on the Brent crude oil

4.3.1.1 Impact on the spot market of Brent

In this section, the Brent crude oil spot and futures markets will be analyzed in order to see if we can notice any reactions to the U.S. Government shutdown of October 2013. The volume of contracts traded for the Brent market were not fully accessible on the CFTC, therefore it will not be possible to make a throughout analysis for this part of the report.

On the figure below, we see the prices of the spot market of Brent for the year 2013. There was a great decrease in prices starting in February until mid of April 2013. During the period of the shutdown, we didn't notice any particular volatility or changes in prices as the decrease started already in September and followed its way through November 2013.

FIGURE 17 - BRENT SPOT PRICES IN US DOLLAR PER BARREL IN 2013



Source: EIA (2015).

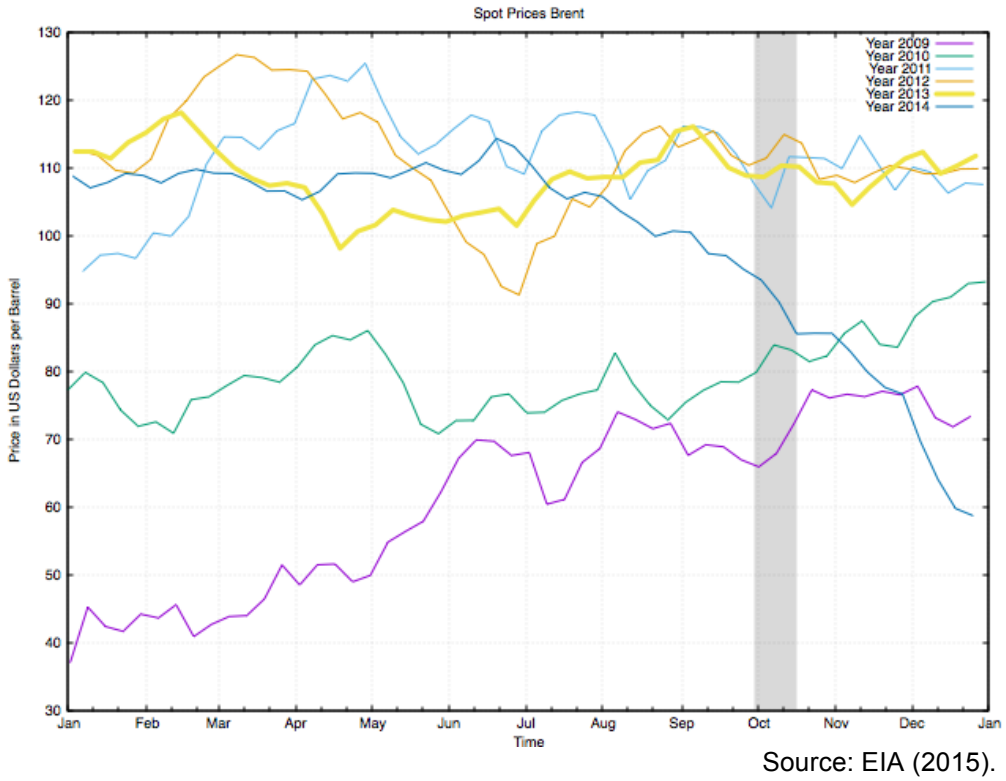
TABLE 5 - WEEKLY EUROPE BRENT SPOT PRICE FOB IN OCTOBER 2013

October 2013	End date	Value (in US dollars per barrel)	Percentage change	Changes from week to week
Week 1	04.10.2013	$108.63	100%	0
Week 2	11.10.2013	$110.30	101.53%	+1.53%
Week 3	18.10.2013	$110.11	101.36%	-0.17%
Week 4	25.10.2013	$107.82	99.25%	-2.11%

Source: EIA (2015).

The analysis of the table above that represents the Weekly Europe Brent Spot Prices FOB* does not indicate a great difference in prices during the U.S. shutdown as the prices increased by 1.53% at the beginning of the shutdown to finally decrease by 2.11% at the end of the month. Again as mentioned earlier, there are other elements to take into consideration for the price volatility as the price of Brent may also have been impacted by the situation in the Middle East for example.

FIGURE 18 - YEARLY SPOT PRICES OF BRENT FROM 2009 TO 2014



Source: EIA (2015).

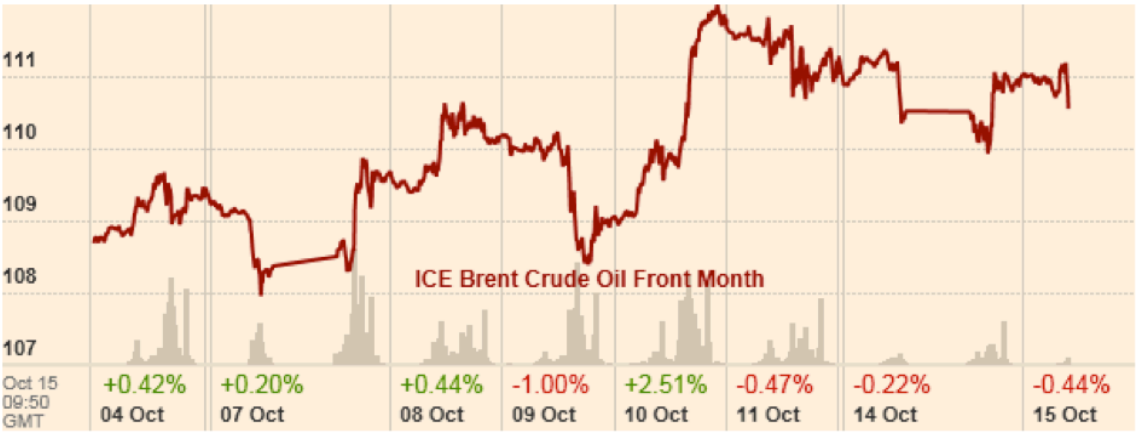
The figure above represents the spot prices for Brent over the last five years. We see that the more volatile year for Brent was 2014. Last year and the beginning of this year have seen a great decrease in prices that had repercussions on the whole trade and on all the markets participants. One of the reasons of this decrease in prices is the increasing production of shale oil by the United States. As a result, the stocks of oil are greatly increasing in the U.S. and the country needs fewer imports than earlier. Moreover, the OPEC does not want to decrease its production quotas, which creates a war over the prices and the production.

We see that the year 2013 is one of the periods with the least volatility in prices. Moreover, the prices are pretty similar with the year 2011 and 2012 as they follow similar patterns.

4.3.1.2 Impact on the futures market of Brent[13]

The Brent futures contracts are traded on the ICE Futures Europe. The ICE was founded in 1980 and is the main place of the benchmark of Brent futures and options contract (ICE, 2015).

FIGURE 19 - ICE BRENT CRUDE OIL FRONT MONTH OCTOBER 2013



Source: Financial Times (2013).

On the figure above, we can see that the Brent crude futures contracts for the front month in October 2013 increased over the period of the U.S. shutdown. We can see a big rise in the prices starting in October 9th 2013. This can be explained by the fact that

[13] The futures contracts specifications for the Brent crude oil traded at the ICE can be found under the Appendix 7.

there was a great possibility that the U.S. Congress would found an agreement at this date, which finally didn't happen. However, the futures prices gained 2.51% at this date Regarding the volume of contracts traded for Brent, the Brent crude oil for November delivery 2013 was 26% lower than the 100-day average (Shenk, 2013).

The CFTC doesn't give a fully detailed report on the Brent markets as it is mainly traded on the ICE. For this reason, this report will not analyze the volume of futures contracts traded for the Brent crude oil. However as the WTI is the U.S. benchmark, we may assume that it was more impacted by the closing than Brent.

4.4 Effects of the U.S. Government shutdown on the corn markets in the United States

This part of the report will analyze the consequences of the federal closing on the corn markets in the United States. The corn markets are really different to the oil markets as they represent a staple good. The changes in prices of agricultural commodities may have dramatic effects on some part of the world where the grains are the basis of alimentation. The U.S. shutdown was not an event that lasted for a long period of time and was insignificant compared to other geopolitical events that did impact the people around the world.

According to Mr. Janvier Nkurunzia from UNCTAD, the financial crisis of 2008 and 2009 has greatly impacted the markets as it drove the prices of necessity agricultural goods up. This phenomenon created a food crisis in some countries as the market participants bought great quantities of food and, as the supplies decreased, some people were left without anything.

Today, an agricultural system of market information is in place in order to avoid food crisis in the future due to lack of information (Interview with M. Nkurunzia, 2015).

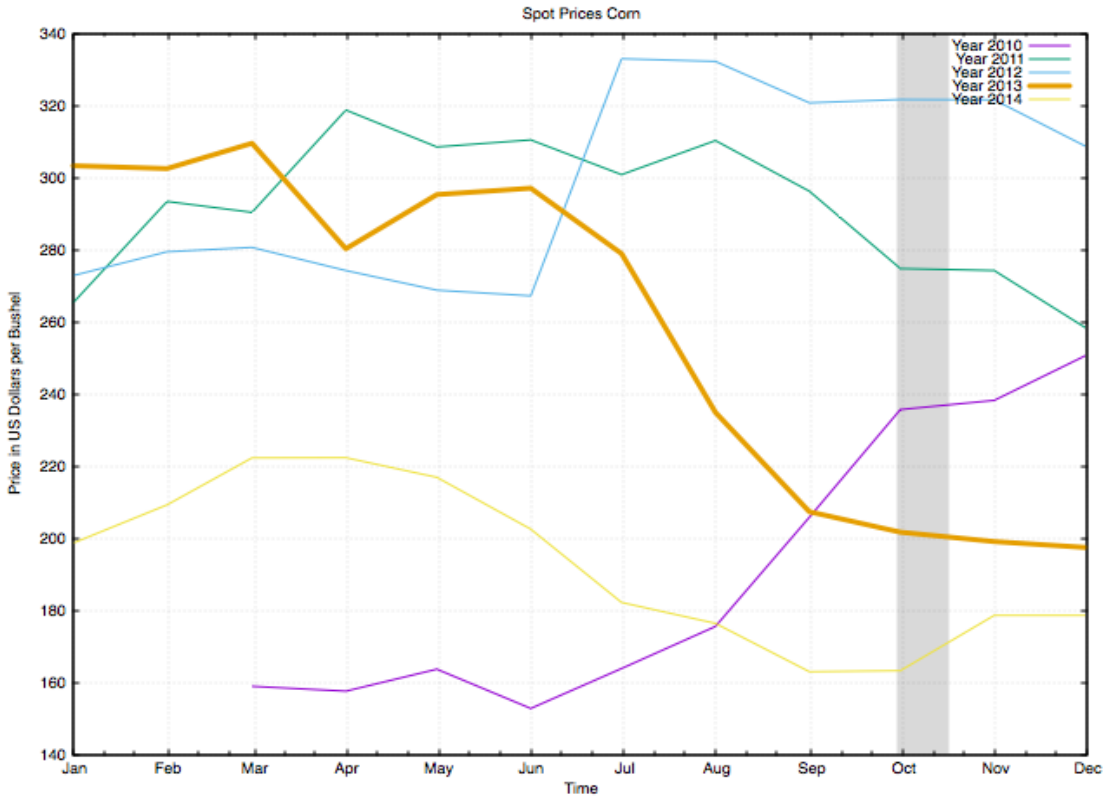
4.4.1.1 Impact on the spot market of corn

Most of the corn production is traded in the Chicago Board of Trade (CBOT) that represents the global benchmark. On the European market, the commodity is traded mainly on the London-based Euronext-Liffe.

On the figure 20 below, we see the prices of the corn spot markets from 2009 to 2014. We can see that it varies greatly over the years due mainly to seasonality and weather changes that affect the production of grains. Corn is subject to strong seasonal patterns that will affect the prices of the grain over the years.

We will focus on the year 2013 and more precisely on the period of the U.S. shutdown. We see that at the beginning of the year, the prices were high but decreased sharply starting in July. This was mainly due to the fact that there was a rumor that the U.S. Environmental Protection Agency was about to lower the ethanol blend mandate from 14.2 billion to actually 13 billion gallons (EIA, 2015).

FIGURE 20 - YEARLY SPOT PRICES OF CORN IN US DOLLARS PER BUSHEL FROM 2009 TO 2014

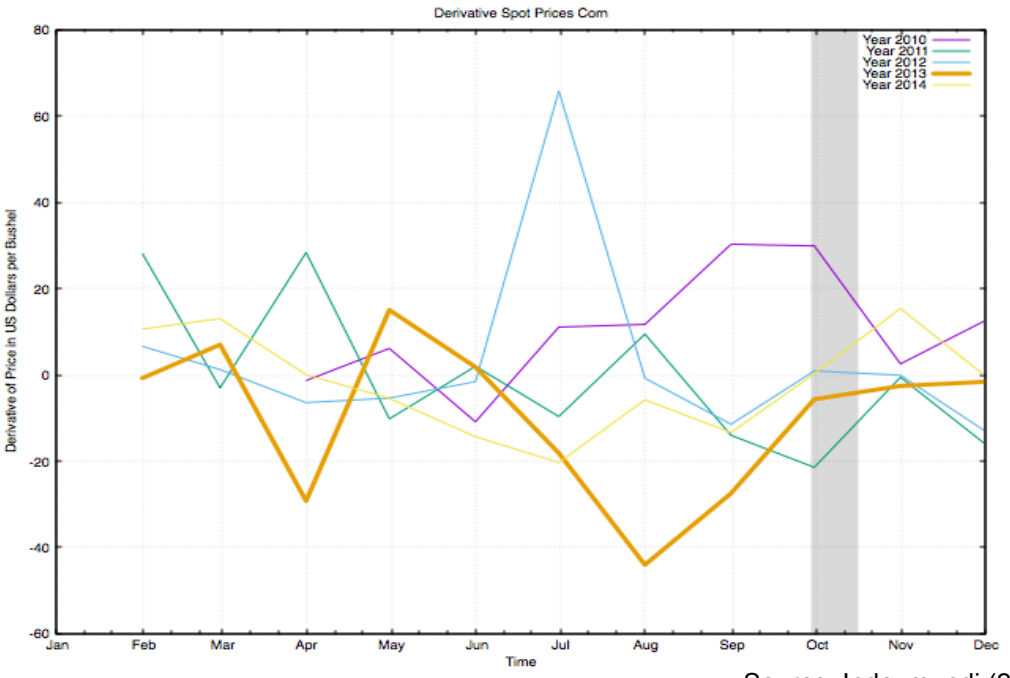


Source: Indexmundi (2015).

On figure 21, we see the derivatives for the corn spot prices over the last five years. We can see again a big fall in the prices in the summer 2013. During the shutdown the prices tended to stabilize after a sharp increase. It is important to remember that the year 2013 was following the very bad drought that occurred in 2012 in the United States. As a result, the markets had great expectations regarding the amount of supply and agricultural production. This may also have impacted the prices for agricultural goods at this period.

Furthermore on the corn markets, there are many other factors that can affect the prices and we saw that the large trading companies have a Research & Development department where they develop their own econometric models in order to determine the data that they need. The models use a number of variables such as the amount of production, demand, supply etc. This technic will help to make price forecasts and give a competitive advantage to the companies (Interview with M. Janvier Nkurunzia, 2015).

FIGURE 21 - DERIVATIVES SPOT PRICES OF CORN FROM 2009 TO 2014



Source: Indexmundi (2015).

4.4.1.2 Impact on the futures market of corn

The corn futures contracts are traded on the Chicago Board of Trade. As mentioned previously, the agricultural markets are subject to seasonality. During fall, the corn market is usually weak as it is the season just before or during the harvest. In the USA, the take in of the crops occurs between September and November. At this time of the year, the corn prices are low because there is a lot of supply on the markets. Furthermore at this period there is a lot of corn that is sold out of the storage to make place for the new crop harvest. As a result, the traders will usually enter into long positions using futures contracts and most of the purchases of corn will occur between October and December (USDA, 2015a).

During the summer, the prices may increase if there is a threat of bad weather for the coming months. If it is not the case, the prices are usually pretty stable during this period. Most of the sales of corn occur between February and May (USDA, 2015a).

According to the interviews gathered with the professionals of the agricultural industry, there was less volatility on the futures agricultural markets at the time of the shutdown due to the uncertainty created by the situation (Interview with Cargill, 2015).

The closing occurred during the harvest season in the United States, which was a problem because not many data on the harvest or stocks were available yet. Some of the companies were dependent and waiting on the different reports to have the necessary information to proceed with the trade.

The biggest agricultural trading companies have a great network of professionals working in the United States who could go on the fields and discuss directly with the producers to have an estimation of the harvest and the quantities that would later be available for trade.

In the case of smaller companies, it is much harder to obtain reliable data because they usually don't have the funds and necessary resources to implement such a network in the country of reference (Interview with Cargill, 2015).

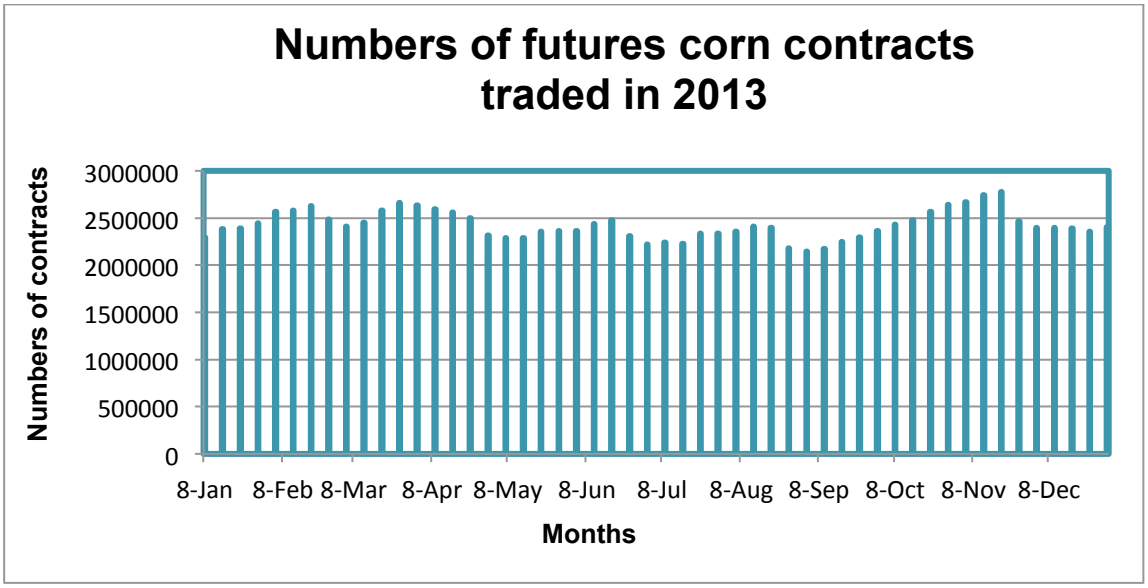
The trade of corn is mainly done on the basis and the group of hedgers can take two different positions: the short hedge and the long hedge. The short hedge is a way to protect the player against a potential decrease in prices over the coming months. On the other hand, the long hedge, preferred by the feeders, importers, processors and purchasers of agricultural products gives protection against increasing prices (CME, 2012).

This report analyzes the impact of the U.S. Government shutdown on the volume of futures grain traded based on the figures given by the CFTC. As for the crude oil markets, it was unfortunately not possible to find any information on the prices of the futures markets of corn during the period of the shutdown of 2013.

Below is a graph representing the amount of disaggregated futures corn contracts traded in 2013 according to the figures published by the CFTC[14]. We can see that the numbers of futures contracts actually tended to increase during the months of October and November. During the month of October 2013, there was an average of 2,496,386 futures contracts traded on the markets compared to 2,387,586 during October 2012. This month represents the time of the harvest and this can create changes on the markets depending on the estimations made by the markets participants regarding the production of corn or other agricultural goods.

[14] You can find the number of open interests and contracts traded of corn for the year 2013 under the Appendix 10.

FIGURE 22 - VOLUME OF FUTURES CORN CONTRACTS TRADED IN 2013



Source: CFTC (2015).

In order to determine if this increase in the number of contracts traded is due to seasonality patterns, we can compare the volume of contracts traded from 2009 to 2014 during the months of October. The average number of contracts that has been traded over the years are the following:

TABLE 6 - NUMBERS OF FUTURES CONTRACTS OF CORN TRADED FROM OCTOBER 2009 TO OCTOBER 2014

Month / Year	Average number of open interest	Average number of contracts
October 2009	927,790	1,855,580
October 2010	1,506,763	3,013,526
October 2011	1,213,865	2,427,730
October 2012	1,243,793	2,387,586
October 2013	1,248,193	2,496,386
October 2014	1,290,628	2,581,256

Source: CFTC (2015).

The numbers of contracts traded tend to remain more or less constant even during the year of the U.S. shutdown. If we compare now what happened to the volume between September and November 2013, we discover that the volume traded during the four weeks of October 2013 did not decrease as implied by the industry of traders. This is surprising as a situation of uncertainty usually pushes the market participants to trade less in order to have fewer risks.

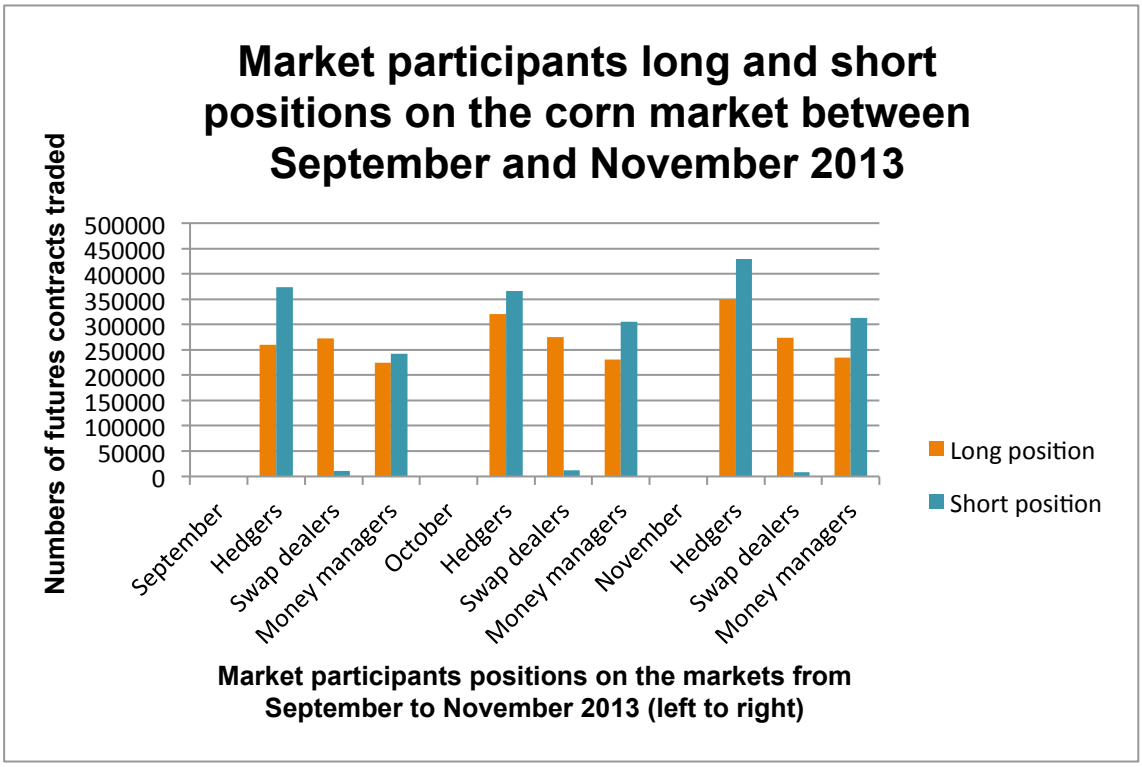
FIGURE 23 - VOLUME OF FUTURES CONTRACTS TRADED ON THE CORN MARKETS FROM SEPTEMBER TO NOVEMBER 2013

Source: CFTC (2015).

We will now compare the different market participants and see which one of them did trade more or less during the shutdown of October 2013. As for the WTI, we will use the figures given by the CFTC and try to see which positions did the players hold during this period.

The figure 24 below shows the difference in the positions of the hedgers; swap dealers and money managers between September and November 2013. From this graph, we can already say that the number of short positions is greater than the amount of long positions. Moreover, we see that the swap dealers tend to use mainly long positions and, on the opposite, the hedgers and the money managers use principally short positions.

FIGURE 24 - POSITIONS HOLD BY THE PARTICIPANTS ON THE CORN MARKETS FROM SEPTEMBER TO NOVEMBER 2013



Source: CFTC (2015).

The table 7 below represents the numbers of positions of the different participants on the corn markets during the period of the shutdown. From this, we can analyze the behaviors of each category of players:

1. The hedgers tend to have net short positions on the futures markets of corn. As seen earlier, in order to reach a short net position, they will sell futures and be long the physical. The group of hedgers tended to take more long positions in October 2013 than in September 2013.

2. The swap dealers were clearly in a state of net long positions. For this report, the spreading was not taken into account. Their positions remained pretty stable throughout the three months.

3. The money managers that include the investments funds for example, also had a net short position. The amount of net short positions increased greatly from September (18,479 contracts) to October 2013 (73,589 contracts).

TABLE 7 - NUMBERS OF LONG AND SHORT POSITIONS TAKEN BY THE MARKET PARTICIPANTS FROM SEPTEMBER TO NOVEMBER 2013 ON THE CORN MARKETS

	September 2013			
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers[15]	259,412	374,096	633,508	Net short 114,684
Swap dealers	272,213	10,520	283,233	Net long 262,193
Money managers	224,259	242,738	466,997	Net short 18,479
	October 2013			
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers	320,462	365,819	686,281	Net short 45,357
Swap dealers	274,466	11,910	286,376	Net long 262,556
Money managers	231,389	304,978	536,367	Net short 73,589
	November 2013			
	Long positions	**Short positions**	**Total number of positions**	**Net positions**
Hedgers	347,885	429,818	777,703	Net short 81,933
Swap dealers	273,997	8,810	282,807	Net long 265,187
Money managers	234,676	312,492	547,168	Net short 77,816

Source: CFTC (2015).

As a conclusion, we may say that the number of contracts traded on the futures exchanges of corn did not decline during the time of the shutdown. According to the specialized press in the grain trade, the trading volume was indeed lighter during the U.S. shutdown due to the lack of information. The markets were bearish, leading the traders to exit their bets as they were trading at a three-year low. The corn markets were less impacted because there was a private Chinese trading company that purchased a total of 420'000 tons of corn from the USA for delivery in 2014 in order to take advantage of the low prices (Weinraub, 2013).

[15] This category includes the producers, users, merchants and processors.

4.5 Relation between the crude oil and corn markets

Over the last years, the production of biofuel has been a factor of growth for the demand of corn. Some Governments decided to introduce blending requirements and gave subsidies to biofuel production, therefore playing a great role in the increase of corn production. Most of those mandates are motivated by political motives such as the reduction of greenhouse gas. As a result, the link between the oil and agricultural markets is reinforced as some of the agricultural production is used to make energy (UNCTAD, 2011).

Ethanol can be made from any high-sugar content crop components transformable into sugar, for example starch or cellulose. Corn contains starch, which can be easily transformed into sugar. This alternative energy is formed with an alcohol-based mixture that is mixed with gasoline in order to produce a fuel that has a higher octane rating and releases less harmful emissions than gasoline when it is unblended. The mixture is made of grains (corn, wheat and barley) that are fermented and distilled (USDA, 2015a).

On a chemical level, ethanol is mainly composed of ethane. The blends of ethanol and gasoline that are composed of at least 85% of ethanol are considered as alternative fuels. The Energy Policy Act of 1992 regulates the ethanol composition. The E85 means that 85% of ethanol are mixed with 15% of gasoline and can be used in flexible fuel vehicles. If there is more ethanol in the mixture, it is a premium alternative fuel such as the E95 (EIA, 2015).

The production of ethanol is good for farmers as it increases the demand for grains and creates new jobs. Moreover, in the United States, ethanol is produced only from domestically grown crops, which tends to decrease the dependency of the U.S. on oil coming from abroad. The disadvantages of producing ethanol are that the production of the grains are requiring too much farmland and it is not worth it to produce ethanol as it requires more energy to be produced than it can actually create (Renewable Fuel Association, 2015).

On the table 8 below, we can see the production of ethanol in the United States between 1990 and 2014. What is striking is the increase in consumption between the year 2000 and 2010 where the production went from 1.65 billion gallons up to 12.86 billion gallons in ten years. Moreover, it continue to increase as the consumption reached 13.47 billion gallons in 2014 (EIA, 2015).

TABLE 8 - U.S. FUEL ETHANOL DATA SUMMARY (IN BILLION GALLONS)

U.S. fuel ethanol data summary (in billion gallons)				
Year	**Production**	**Net Imports**	**Inventory change**	**Consumption**
1990	0.75	Not available	Not available	0.75
2000	1.62	0.12	-0.62	1.65
2010	13.30	-9.12	2.35	12.86
2014	14.34	-18.45	2.32	13.47

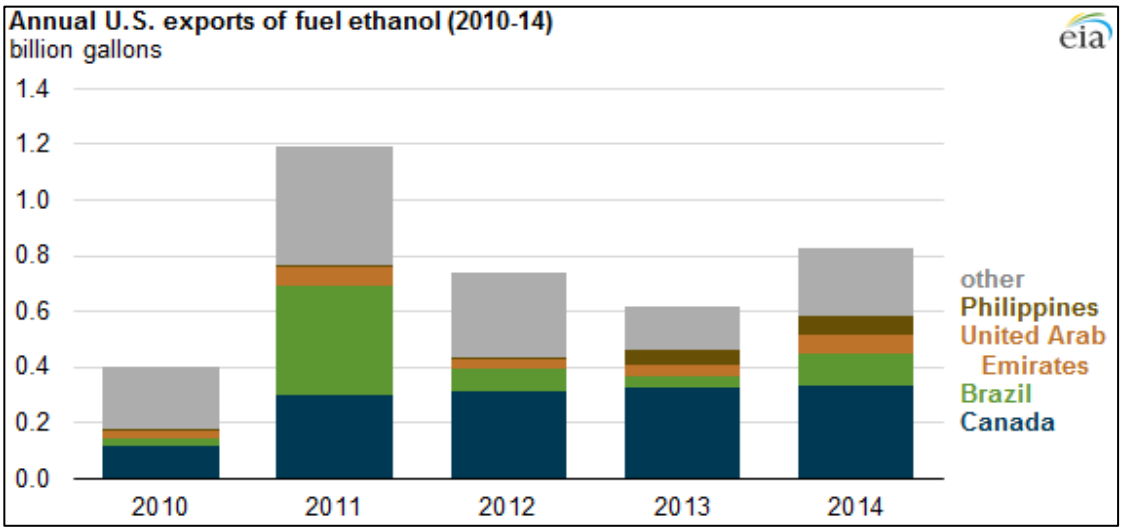
Source: EIA (2015).

In 2013, about 40% of the corn production of the United States was later manufactured into ethanol. Moreover, the U.S. Government is subsidizing the production of ethanol, which provokes some drawbacks on the markets. First of all, as the production of corn is used in order to produce fuel, it is harder for farmers who have livestock to find corn to feed their herds. As a consequence, the farmers cut the number of animals and the prices of the meat increase on the markets. Furthermore, the fact that the producers plant an increasing amount of corn in the same area increases the risk of developing plant disease (EIA, 2013).

In 2014, 14.34 billion of gallons of ethanol were produced in the United States. We see that the production of ethanol is growing in importance over the years and, as a result, its exports are increasing greatly as can be seen on the figure 25.

We see that the USA mainly exports ethanol to Canada (about 0.35 billion gallons in 2014), to Brazil, to the United Arab Emirates and the Philippines (EIA, 2013). The annual exports vary greatly over the years depending on the production of corn in the United States. For example we see that during the year of the drought in 2012, there was a decrease in the numbers of ethanol exports compared to the year 2011.

FIGURE 25 - ANNUAL U.S. EXPORTS OF FUEL ETHANOL FROM 2010 TO 2014



Source: EIA (2015).

Today, most of the gasoline sold in the United States contains ethanol, the amount of which depends on the states and the different regulations. According to the EIA, in 2014 about 13 billions gallons of ethanol were added to U.S. produced gasoline. As a result, the U.S. farmers tend to plant more corn on the detriment of other grains because it is more profitable (EIA, 2015).

By delaying the release of information on the markets of crude oil and corn, the U.S. Government shutdown also impacted indirectly other markets, such as ethanol. Without information on the quantity of corn harvested, for example, the production of ethanol may have been compromised or miscalculated.

5. Conclusion

The role of information in commodities trading is crucial for the market participants. Through the interviews with professionals from the industry, I could see that the large trading companies are ready to face a situation such as the U.S. Government shutdown as they have an R&D department where research analysts work on developing tools that are optimized to give the closest forecasts possible. Those models take into consideration various factors such as the production, supply, demand, etc. For them, an event such as a federal shutdown is more a competitive advantage than a great issue.

For small and medium companies, the closing had negative consequences and created problems as they usually only have the figures given by the public administrations as reference. The non-release of the reports containing the data did therefore impact their trade and may have forced them to take more risks. According to remarks made by the people I interviewed, there was more volatility on the spot markets during the time of the shutdown and less volume traded on the futures markets. The reason was that the investors feared the lack of information and decreased their risk during that time of uncertainty.

With this report, I wanted to challenge those remarks and see whether there were indeed significant movements on the markets in October 2013. Moreover, I wanted to discover which importance did the reports of the U.S. Government have for the market participants.

During the elaboration of my project, I had to face data constraints, as the prices of the futures contracts for October 2013 were not publicly available. However, I am confident with the analysis of the figures provided by the Commodity Futures Trading Commission as those are seen as a reliable source of information and come from an organization that is keen on developing more market transparency.

The first finding of my research is that large trading companies do not depend on the release of the reports in order to obtain data on which they can base their trading decisions. From my interviews with Cargill, Bunge and Mercuria, I learned that the physical traders working for such large companies have other means to find information. There are many different sources and it is part of the work of the physical traders to sort the data and choose the ones that are more significant for the interest of their company. As a result, the U.S. Government shutdown and the non-release of

information during this period was a competitive advantage for them as they had good estimations based on their model that some competitors did not have. Even if the shutdown had lasted more than two weeks, the large trading companies would have been better off.

On the other hand, the market participants trading for individuals or smaller companies did not have access to the information that they needed in order to take appropriate trading decisions. The access to data for them was too costly or they simply did not have other reliable sources to count on. As a consequence, the smaller companies did suffer from the U.S. shutdown due to the lack of information released on the markets. This category is dependent on the data released by the federal administration because they don't have other ways or financial resources to find information.

In order to see which concrete impact the shutdown had on the markets, I decided to analyze the crude oil markets, mainly the WTI and Brent markets, and the corn markets. The link between the two is the ethanol, which is produced with corn in the United States.

The spot markets of both crude oil and corn have seen some volatility during the time of the shutdown; however, nothing of great significance. The markets are very sensitive to all types of information and react quickly by developing some volatility on the short term. The role of information is to make the markets more efficient; nevertheless, it is not possible for a market to be totally effective and transparent (Interview with UNCTAD, 2015). The volatility at the period of the U.S. shutdown may also be the result of other geopolitical events occurring at the same time.

As there was no information on the prices for the futures markets for those two commodities at the time of the shutdown, I decided to analyze the amount of volume traded on the WTI crude oil and corn markets at that time of the year. What came out of this investigation is that the WTI crude oil futures markets have indeed shown a decrease in the amount of futures contracts traded during the month of October 2013. This may have reflected the fear of the investors to invest in the American crude oil benchmark at this period, as there was uncertainty on the length of the shutdown. As mentioned above, the markets may also have reacted to other factors. My talk with an oil trading company taught me that the release of the reports on the markets is only one price drivers among many others.

The volumes of the corn futures markets were also analyzed and compared with previous years but contrary to the crude oil markets, the amount of volume traded

seemed to have been stable. There was no sign of a decrease of contracts traded at this period. According to the financial specialized press, this is because a trading Chinese firm actually bought a great quantity of corn, thus taking advantage of the low prices.

In consequence, we can say that the closing down of the Government has not impacted all of the commodities markets. We saw that the crude oil markets seemed to have shown a decrease in the volume of contracts traded but this was not the case with the numbers of futures corn contracts that remained stable.

I assume that the corn markets were less impacted by the U.S. shutdown as it occurred during the time of the harvest in the United States and the market participants already knew that this year would show exceptional numbers as it was following the year of 2012 during which the drought occurred. We may therefore assume that the production estimations were already made and that the shutdown would have no impact on the trade. The professionals working in the industry did tell me that there was less volume traded on the futures contracts, however, this was probably the case for other agricultural products that have different seasonality patterns for example.

As a conclusion I would like to add that during my research, all the markets participants interviewed told me how important the information is for them. Most of the traders are dependent on information; however, the occurrence of the U.S. Government shutdown may have make them conscious that the information is not provided for granted and that it would be a competitive advantage to have other ways to find information. The publications will still have a great importance; however, it is the responsibilities of the physical traders to not rely only on a single source of information.

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Appendices

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Appendix 1 - Antideficiency Act Background

The Antideficiency Act prohibits federal employees from

- making or authorizing an expenditure from, or creating or authorizing an obligation under, any appropriation or fund in excess of the amount available in the appropriation or fund unless authorized by law. 31 U.S.C. § 1341(a)(1)(A).
- involving the government in any obligation to pay money before funds have been appropriated for that purpose, unless otherwise allowed by law. 31 U.S.C. § 1341(a)(1)(B).
- accepting voluntary services for the United States, or employing personal services not authorized by law, except in cases of emergency involving the safety of human life or the protection of property. 31 U.S.C. § 1342.
- making obligations or expenditures in excess of an apportionment or reapportionment, or in excess of the amount permitted by agency regulations. 31 U.S.C. § 1517(a).

Federal employees who violate the Antideficiency Act are subject to two types of sanctions: administrative and penal. Employees may be subject to appropriate administrative discipline including, when circumstances warrant, suspension from duty without pay or removal from office. In addition, employees may also be subject to fines, imprisonment, or both.

4.6 Reporting Requirements

Once it is determined that there has been a violation of 31 U.S.C. §§ 1341(a), 1342, or 1517(a), the agency head "shall report immediately to the President and Congress all relevant facts and a statement of actions taken." 31 U.S.C. §§ 1351, 1517(b). The reports are to be signed by the agency head. The report to the President is to be forwarded through the Director of OMB. In addition, the heads of executive branch agencies and the Mayor of the District of Columbia shall also transmit "[a] copy of each report . . . to the Comptroller General on the same date the report is transmitted to the President and Congress." 31 U.S.C. §§ 1351, 1517(b), as amended by the Consolidated Appropriations Act, 2005, Pub. L. No. 108-447, div. G, title II, § 1401, 118 Stat. 2809, 3192 (Dec. 8, 2004).

OMB has issued further instructions on preparing the reports, which may be found in OMB Circular No. A-11, Preparation, Submission, and Execution of the Budget, § 145 (June 21, 2005). The report is to include all pertinent facts and a statement of all actions taken to address and correct the Antideficiency Act violation (such as administrative discipline imposed, referral to the Justice Department where appropriate, and new safeguards imposed). An agency also should include a request for a supplemental or deficiency appropriation when needed.

What if GAO uncovers a violation but the agency thinks GAO is wrong? The agency must still make the required reports, and must include an explanation of its disagreement.

Appendix 2 - Interview with Cargill

The interview with Cargill was held over the phone on April 15th 2015.

Was the timing of the U.S. shutdown of October 2013 a problem for your company?

The shutdown occurred during the time of the harvest of corn in the United States. Moreover, the shutdown lasted for two weeks officially but for our company it lasted even more as the data of the EIA and the USDA were not released before two or three weeks later.

How did you manage to trade without the data released by the U.S. Government?

Our company has a "blackbox" that is a statistical model that estimates and predicts the figures based on the historic variations, the type of changes and the changes of the prices. The goal is to mitigate the effect of an event such as the Government shutdown in the commodities trading world. Additionally, our company has people working on the field in the United States and that gives us a competitive advantage as the farmers and suppliers work directly with us. Other companies can't afford this service or have to pay prices to obtain them.

What was the general feeling in the markets?

As a result of the shutdown, there was a lot of uncertainty. Moreover, it made the industry realized that maybe one day, the whole system of release of information of the EIA and USDA could disappear.

Globally, this was a major macroeconomic event. The result was that there was a lot of outflow in the macroeconomic funds. When the market is facing a lot of uncertainty, such as during the Ukrainian crisis or the votation for a new president, the people remove their funds and that has great impact on commodities trading. The situation resulted in companies and people decreasing their global risk. This was not the case for the hedge funds because they can have more information but others parties are dependent on the data provided by the EIA and the USDA. Those reports as well as the information released on the prices are documents that everyone uses in the industry.

Appendix 3 - Interview with Bunge

The interview was held in the Bunge office in Geneva with Mr. Philippe Aellig and Mr. Paul Moreau on the 30th of April 2015.

Which are the most important reports that you use to trade in your company?

We use and follow mainly the reports of the United States Department of Agriculture. Every week and months there are reports that are released on different topics. The most important for us are the ones regarding the inspection, the exports and the World Agricultural Supply and Demand Estimates reports. Per year, there are about seven to eight reports that are very important and create volatility on the markets. Moreover, there are four reports that are released at the end of each quarter and that give important information on the stocks. Those publications create a lot of volatility and usually bring the markets up to their limits.

What consequences did the fact that the reports were not released had on your company?

For us, it didn't have a great impact because we have a whole department in our company that focus on estimating the numbers that are released by the USDA. We have our own estimation and we try to have a guess on the numbers that will be released. So the non-release of the reports is almost a competitive advantage for us because we have the possibility to develop our own tools to discover those figures by ourselves.

How does your research department work?

We have an internal department that works on the field, measures the flows, estimates the demand etc. Moreover, we have analysts in the United States that estimate the harvest and do their best to predict the figures that will be released by the USDA before it is actually released. Every year, the research department is developing more accurate tools.

Can you tell me how the production of ethanol impact the corn markets?

It is very important to express the ethanol in function of its energetic value. Since 2003, the energetic value of corn is higher than the one of crude oil. Therefore, the countries decided to mandate and subsidize the production of corn. This developed an incentive for the farmers to produce more corn.

What is the role of information in commodities trading?

It is crucial. The best example is the fact that every time that the reports are released, it creates volatility on the markets. For example, the WASDE is released once a month at 6pm and we can see that the markets start to move up and down even a few minutes before the release. It creates volatility for a few hours/days and then it goes back to normal.

Appendix 4 - Interview with Mercuria Energy Trading

The interview was held over the phone with Mr. Benoît Lioud on the 7th of May 2015.

Which sources do you use to obtain information on the oil markets?

There are different reports that come from various sources depending on the products. The reporting agencies such as Platts or Argus give us price information; however, trading companies participate to the price discovery. Every day, we give price and trade information to the Platts agency that will later combine all these data to publish price assessments. In order to receive the final numbers, we need to have a membership, so basically, we participate to the process and finally we pay to get the results!

Every company has different interest in the information. What we want are concrete data, not estimation. We also receive information from official sources, such as the EIA. Professional organizations such as API are also gathering and publishing data. The company could be a member. The information coming from the API and the EIA are mainly concerning the level of stocks. However, these agencies are gathering numerous fundamental data, which can be further compiled, by consultants and analysts. We can also receive information from press agencies or financial news such as Reuters or Bloomberg. It is crucial for us to sort all the information that we have access to and retain only the most relevant ones.

What happens if the reports from the U.S. Government are not released?

People are used to receive the reports from the Government and they might overestimate their real impact on price dynamics. However, they remain important sources of fundamental information. If one report is exceptionally not published, market participants can leave with the latest publication. Price fluctuations are not entirely related to those reports, as they are only one price driver among others. There is no automatic link to the data released.

Moreover, the companies have internal models that they use and that can estimate the missing data. We don't take directional positions so for us it is not a problem to have fluctuations in prices. At the end what is important is the actual supply and demand estimation of physical products that need to be delivered in a particular region and at particular date. For example, we can count how many vessels are currently on the sea and how many will arrive at the same time at the same port. This will determine the

supply and demand with more precision than the reports. As physical traders, we are concerned by the price of these products more than the price of benchmarks that can be hedged quite easily.

So to sum up, the non-release of the reports from the Government can be somewhat bothering but we have other alternatives available. It is our responsibility not to rely on single source and organize multiple channels of information.

Appendix 5 - Interview with the Mr. Nkurunzia from UNCTAD (20.05.2015)

The interview was held over the phone on May 20th 2015 with Mr. Nkurunzia who is the Chief of the Commodity Research and Analysis Section at the United Nations Conference on Trade and Development (UNCTAD).

There are four competitive factors that make a market efficient and the access to information is one of them. It has to be full, perfect and transparent; however, it is not the case most of the times. The futures prices will depend on demand and supply factors. The market participants have to know how reliable the information is as this will determine the prices of the transactions.

The large trading companies have a Research and Development department that build tools to estimate econometric models with a number of variables. The goal is to create information to give a competitive advantage. The companies will use internal tools in order to determine the figures that they need. As the information is not perfect, the trading businesses build models with different variables (production, demand, supply etc.). Having information is a competitive advantage; it will make a company better off towards its competitors.

In some cases, the markets face the problem of insider information. For example, if one company receives information on the forthcoming collapse of another business and sell its stocks before it happens. This is a crime and the participants may be prosecuted. The companies engaged in this crime will perform highly until they get caught.

Depending on the information, the prices will be influenced on the short or long term.

The efficient market hypothesis is a specific issue. It is particularly applicable to the case of high frequency trading that also requires high frequency information. Those markets will process the information that they received with the help of very technical tools and analysis.

The markets are never perfectly efficient as it is not possible to have all the information.

A good example of the importance of the role of information is what happened during the financial crisis of 2008-2009. At this period, the prices of food increased greatly, which lead to a food crisis. This happens when everyone starts to buy great quantities and, as a result, the supply starts to decrease. The consequences are higher prices due to low supply. The G20 decided to create a system of information in order to avoid

further food crisis and the lack of information during those periods of turmoil. The term panic buying means that the people buy a lot of quantity by fear of not having enough food in the coming days or weeks. An agricultural market information system has been developed recently. The main goal is to avoid a food crisis to happen because of the lack of information. There is now a monthly bulletin that is published and publicly shared in order to avoid panic buying. The last meeting on this matter took place in Rome last week. This system is similar to JODI, which is used on the oil markets. For the agricultural markets, the system is called AMIS.

Appendix 6 - Specifications for the futures contracts of WTI (NYMEX)

Product symbol	**CME Globex: CSX Clearing: CS**	
Venue	CME Globex, CME ClearPort, Open Outcry (New York)	
Hours (All Times are New York Time/ET)	CME Globex	Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. Chicago Time/CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT)
	CME Clearport	Sunday – Friday 6:00 p.m. – 5:15 p.m. (5:00 p.m. – 4:15 p.m. Chicago Time/CT) with a 45-minute break each day beginning at 5:15 p.m. (4:15 p.m. CT)
	Open Outcry	Monday – Friday 9:00 AM to 2:30 PM (8:00 AM to 1:30 PM CT)
Contract units	1,000 barrels	
Price quotation	U.S. Dollars and Cents per barrel	
Minimum fluctuation	$0.01 per barrel	
Floating price	The Floating Price for each contract month is equal to the arithmetic average of the NYMEX Light Sweet Crude Oil Futures first nearby contract settlement price for each business day that it is determined during the contract month.	
Termination of trading	Trading shall cease on the last business day of the contract month.	
Listed contracts	9 years listed annually (12 new months listed once a year)	
Settlement type	Financial	
Position limits	NYMEX Position Limits	
Rulebook Chapter	510	
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of NYMEX.	

Source: CME (2015).

Appendix 7 - Specifications for the futures contracts of Brent (ICE Futures Exchange)

Contract symbol	**B**
Contract size	1,000 barrels
Units of trading	Any multiple of 1,000 barrels
Currency	US Dollars and cent
Trading price	One cent ($0.01) per barrel
Settlement price	One cent ($0.01) per barrel
Minimum Price Flux	One cent ($0.01) per barrel
Expiration Date	**Contract Months up to and including February 2016:** Trading shall cease at the end of the designated settlement period on the Business Day (a trading day which is not a public holiday in England and Wales) immediately preceding either: (i) the 15th calendar day before the first calendar day of the contract month, if such 15th calendar day is a Business Day; or, (ii) if such 15th calendar day is not a Business Day the next preceding Business Day. **Contract Months from March 2016:** Trading shall cease at the end of the designated settlement period on the last Business Day of the second month preceding the relevant contract month (e.g. the March contract month will expire on the last Business Day of January). If the day on which trading is due to cease would be either: (i) the Business Day preceding Christmas Day, or (ii) the Business Day preceding New Year's Day, then trading shall cease on the next preceding Business Day

Contract Security	ICE Clear Europe acts as the central counterparty for trades conducted on the London exchanges. This enables it to guarantee the financial performance of every contract registered with it by its members (the clearing members of the exchanges) up to and including delivery, exercise and/or settlement. ICE Clear Europe has no obligation or contractual relationship with its members' clients who are non-member users of the exchange markets, or non-clearing members of the exchanges.
Daily Settlement	The weighted average price of trades during a two minute settlement period from 19:28:00, London time.
Daily Margin	All open contracts are marked-to-market daily.
Position Limits	The Brent crude future is a cash-settled contract. The Exchange's daily position management regime requires that all positions in any contract month must be reported to the exchange on a daily basis. The Exchange has powers to prevent the development of excessive positions or unwarranted speculation or any other undesirable situation and may take any steps necessary to resolve such situations including the ability to mandate members to limit the size of such positions or to reduce positions where appropriate
Expiry Limits	The Exchange may impose limits on positions in this contract at its discretion in accordance with Exchange Rule P3. Current expiry limit: 6,000 contracts in the last five business days, up to and including the expiry day in the spot month, inclusive of futures-equivalent position in Brent Options. Exemptions from expiry limits may be granted at the Exchange’s discretion to participants who provide and document a commercial rationale for their requirement
Contract Series	Consecutive months up to and including

	December 2022
Trading Methods	Electronic futures, Exchange of futures for physical (EFP), Exchange of futures for swap (EFS) and Block Trades are available for this contract.
Delivery/Settlement Basis	The ICE Brent Crude futures contract is a deliverable contract based on EFP delivery with an option to cash settle against the ICE Brent Index price for the last trading day of the futures contract. The Exchange shall publish a cash settlement price (the ICE Brent Index price) on the next trading day following the last trading day for the contract month.
Business Days	ICE Business Days
MIC Code	IFEU
Clearing Venue	ICEU

Source: ICE (2015).

Appendix 8 - Specifications for the futures contract of corn (CBOT)

Contract size	5,000 bushels (about 127 Metric Tons)
Deliverable Grade	#2 Yellow at contract Price, #1 Yellow at a 1.5 cent/bushel premium #3 Yellow at a 1.5 cent/bushel discount
Pricing Unit	Cents per bushel
Tick Size (minimum fluctuation)	1/4 of one cent per bushel ($12.50 per contract)
Contract Months/Symbols	March (H), May (K), July (N), September (U) & December (Z)
Trading Hours	CME Globex (Electronic Platform) Sunday – Friday, 7:00 p.m. – 7:45 a.m. CT and Monday – Friday, 8:30 a.m. – 1:15 p.m. CT Open Outcry (Trading Floor) Monday – Friday, 8:30 a.m. – 1:15 p.m. CT
Daily price limit	View Daily Price Limits for initial and expanded price limits. There shall be no price limits on the current month contract on or after the second business day preceding the first day of the delivery month.
Settlement procedure	Daily Grains Settlement Procedure (PDF) Final Corn Settlement Procedure (PDF)
Last Trade Date	The business day prior to the 15th calendar day of the contract month
Last Delivery Date	Second business day following the last trading day of the delivery month.
Product Ticker Symbols	CME Globex (Electronic Platform) ZC C = Clearing Open Outcry (Trading Floor) C
Exchange Rule	These contracts are listed with, and subject to, the rules and regulations of CBOT.

Source: CME (2015).

Appendix 9 - Volume of open interests and futures contracts of WTI crude oil traded during the year 2013

Weeks	Open positions	Numbers of contracts
8th of January	166,769	333,538
15th of January	169,789	339,578
22nd of January	174,015	348,030
29th of January	177,223	354,446
5th of February	166,295	332,590
12th of February	169,082	338,164
19th of February	174,006	348,012
26th of February	176,702	353,404
5th of March	171,519	343,038
12nd of March	173,330	346,660
19th of March	175,656	351,312
26th of March	178,502	357,004
2nd of April	167,827	335,654
9th of April	175,328	350,656
16th of April	176,136	352,272
23rd of April	177,884	355,768
30th of April	178,609	357,218
7th of May	165,915	331,830
14th of May	167,266	334,532
21st of May	169,716	339,432
28th of May	170,812	341,624
4th of June	158,242	316,484
11th of June	159,124	318,248
18th of June	162,223	324,446
25th of June	164,708	329,416
2nd of July	160,197	320,394
9th of July	161,609	323,218
16th of July	163,854	327,708
23rd of July	166,825	333,650
30th of July	167,537	335,074
6th of August	157,339	314,678

13th of August	159,824	319,648
20th of August	162,120	324,240
27th of August	164,358	328,716
3rd of September	157,272	314,544
10th of September	161,669	323,338
17th of September	164,132	328,264
24th of September	166,746	333,492
1st of October	156,324	312,648
8th of October	159,124	318,248
15th of October	159,492	318,984
22nd of October	161,136	322,272
29th of October	162,352	324,704
5th of November	154,213	308,426
12th of November	156,167	312,334
19th of November	157,941	315,882
26th of November	159,546	319,092
3rd of December	149,954	299,908
10th of December	155,871	311,742
17th of December	157,147	314,294
24th of December	162,991	325,982
31st of December	163,455	326,910

Source: CFTC (2015).

Appendix 10 - Volume of open interests and futures contracts of corn traded during the year 2013

Weeks	Open positions	Numbers of contracts
8th of January	1,148,434	2,296,868
15th of January	1,192,286	2,384,572
22nd of January	1,194,796	2,389,592
29th of January	1,223,428	2,446,856
5th of February	1,282,117	2,564,234
12th of February	1,291,268	2,582,536
19th of February	1,313,307	2,626,614
26th of February	1,242,545	2,485,090
5th of March	1,204,304	2,408,608
12nd of March	1,224,316	2,448,632
19th of March	1,290,733	2,581,466
26th of March	1,330,486	2,660,972
2nd of April	1,315,116	2,630,232
9th of April	1,297,225	2,594,450
16th of April	1,280,221	2,560,442
23rd of April	1,250,211	2,500,422
30th of April	1,156,343	2,312,686
7th of May	1,143,527	2,287,054
14th of May	1,144,874	2,289,748
21st of May	1,176,120	2,352,240
28th of May	1,181,497	2,362,994
4th of June	1,179,731	2,359,462
11th of June	1,217,400	2,434,800
18th of June	1,239,198	2,478,396
25th of June	1,155,457	2,310,914
2nd of July	1,109,480	2,218,960
9th of July	1,119,889	2,239,778
16th of July	1,114,755	2,229,510
23rd of July	1,168,749	2,337,498
30th of July	1,169,039	2,338,078
6th of August	1,177,978	2,355,956

13th of August	1,206,286	2,412,572
20th of August	1,199,310	2,398,620
27th of August	1,090,214	2,180,428
3rd of September	1,071,732	2,143,464
10th of September	1,084,845	2,169,690
17th of September	1,124,419	2,248,838
24th of September	1,147,298	2,294,596
1st of October	1,182,752	2,365,504
8th of October	1,215,467	2,430,934
15th of October	1,237,489	2,474,978
22nd of October	1,284,218	2,568,436
29th of October	1,321,037	2,642,074
5th of November	1,332,836	2,665,672
12th of November	1,371,072	2,742,144
19th of November	1,386,379	2,772,758
26th of November	1,232,930	2,465,860
3rd of December	1,199,036	2,398,072
10th of December	1,199,525	2,399,050
17th of December	1,194,658	2,389,316
24th of December	1,178,132	2,356,264
31st of December	1,202,945	2,405,890

Source: CFTC (2015).

Appendix 11 - Amount of short and long positions taken by the markets participants on the WTI futures markets from 2010 to 2014

HEDGERS GROUP Producer / Merchant / Processor / User		SPECULATORS GROUP			
		Swap Dealers		Money Managers	
Average October 2010: Open Interest --> 239,444					
Long position	Short position	Long position	Short position	Long position	Short position
49,277	45,948	63,172	61,586	728	0
Average changes October 2010					
46	(323)	(718)	2,775	(276)	0

HEDGERS GROUP Producer / Merchant / Processor / User		SPECULATORS GROUP			
		Swap Dealers		Money Managers	
Average October 2011: Open Interest --> 207,794					
Long position	Short position	Long position	Short position	Long position	Short position
42,141	31,882	43,187	80,516	1,179	0
Average changes October 2010					
(721)	(658)	(1,266)	(214)	23	0

HEDGERS GROUP Producer / Merchant / Processor / User		SPECULATORS GROUP			
		Swap Dealers		Money Managers	
Average October 2012: Open Interest --> 181,668					
Long position	Short position	Long position	Short position	Long position	Short position
24,924	11,964	28,193	72,425	8,475	0
Average changes October 2012					
(264)	(1,080)	(344)	(295)	2	0

HEDGERS GROUP Producer / Merchant / Processor / User		SPECULATORS GROUP			
		Swap Dealers		Money Managers	
Average October 2013: Open Interest --> 159,686					
Long position	Short position	Long position	Short position	Long position	Short position
12,337	18,452	39,147	75,686	0	3,962
Average changes October 2013					
(638)	(29)	146	48	(1,785)	(294)

HEDGERS GROUP Producer / Merchant / Processor / User		SPECULATORS GROUP			
		Swap Dealers		Money Managers	
Average October 2014: Open Interest --> 145,946					
Long position	Short position	Long position	Short position	Long position	Short position
13,369	6,786	18,011	63,043	7,844	0
Average changes October 2014					
(440)	179	(466)	(281)	17	0

Source: CFTC (2015).